What’s New in v2025.4?

Custom IC Design

December 2025

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OS Support

- REDHAT 7.9 - Last release to support
- REDHAT/ROCKY 8/9

- Python 3
  - Python 3 is supported for internal usage only now
  - Latest version of Ciranova supports Python 3.8

Technology Support

- Continue to drive support of smaller and non traditional CMOS technologies
  - TSMC N7
  - TSMC Coupe - photonics

Library Manager

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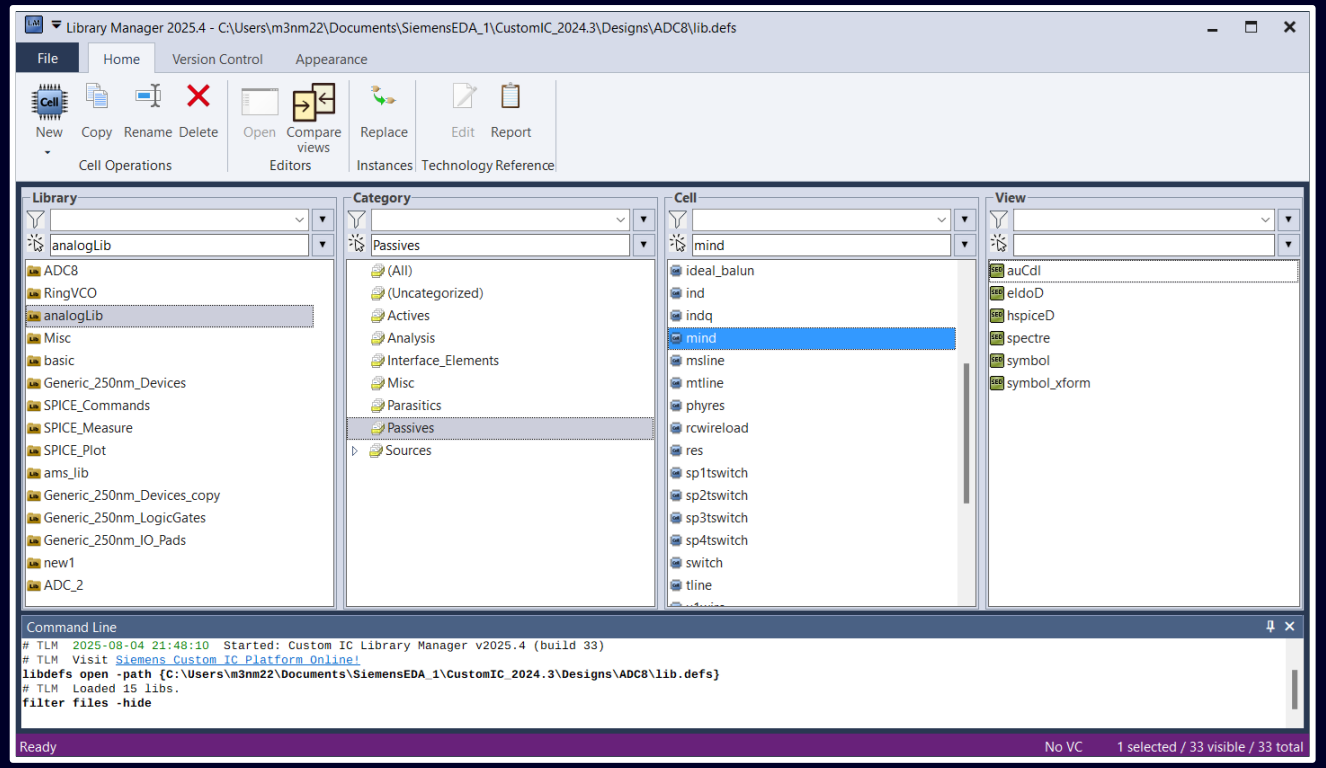
Library Manager

- Improved usability
- Added a new UI mode to display data as lists
- Lists represent Libraries, Categories, Cells, and Views
- Categories can be enabled or disabled
- Files can be enabled or disabled



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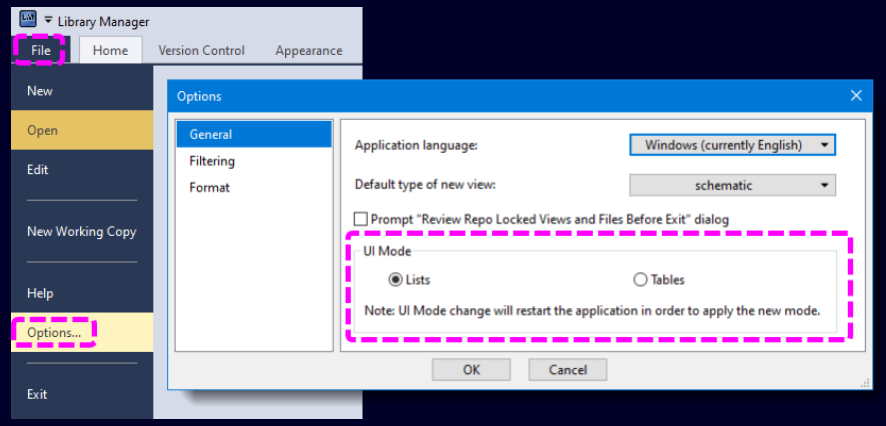
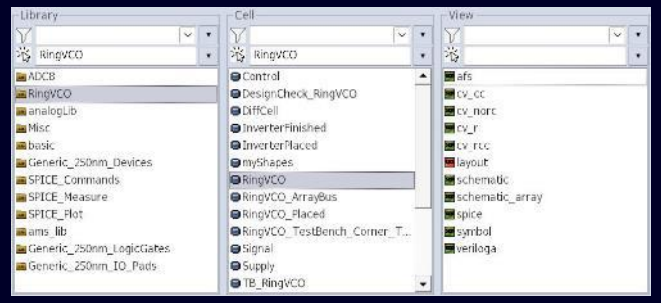
Library Manager

- Two Display Modes
  - Set via File > Options… - UI Mode which requires Library Manager to restart

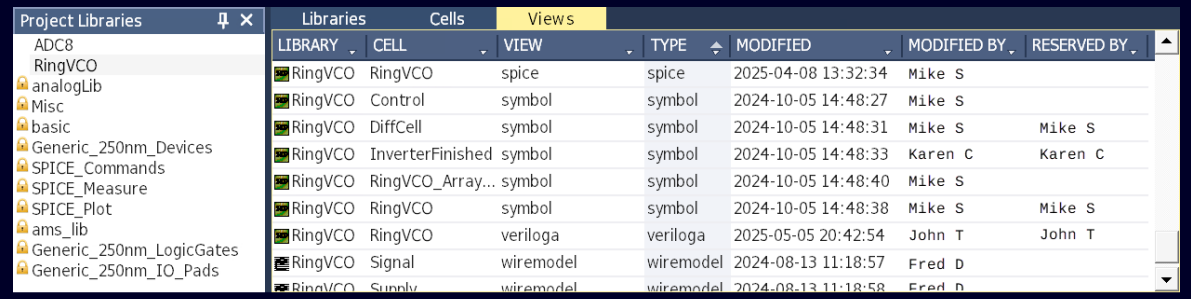


List View (Default)



- Familiar Look
- Narrow/specific data displayed
- Single Selection
- Best mode for operations on a single cell view
- Faster Startup

Table View (Advanced)



- Wide/comprehensive data displayed
- Multiple selections
- Best mode for operations on multiple cell views or on cells or libraries
- Suitable for CAD managers, PDK developers

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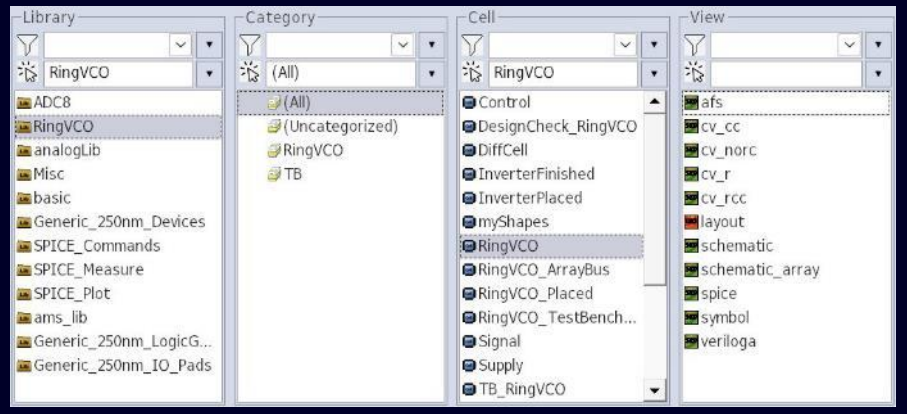
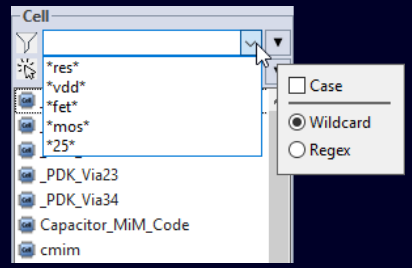
Library Manager

- List View
  - Displays Libraries, Categories, Cells, and Views as lists instead of tables that only displays subsequent levels of information based on selection, i.e., only display the cell views after selecting a single cell from the selected library
- Performance Optimization
  - Uses background threads for async data loading in Library Manager
  - Library Manager Start-up is significantly faster compared to older versions
- Filtering
  - Filter using wildcards or regular expressions or select from a history of previously specified filters





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Schematic Design & Simulation Interface

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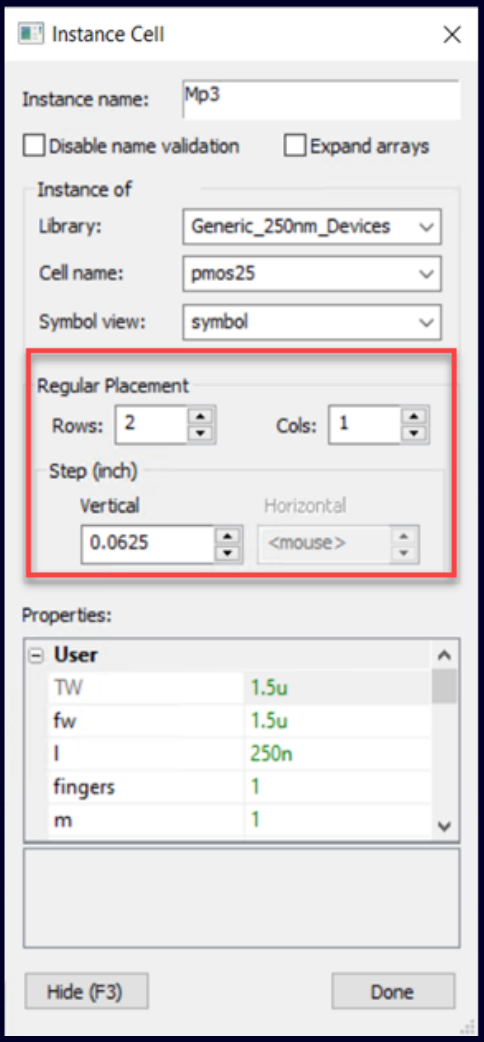
S-Edit & Simulation Interface New Features Overview

- S-Edit
  - Regular Placement During Instancing Duplicate By
  - Highlight Manager
  - Highlight Reflections
- Hierarchy Editor
  - Context menu to set bindings from schematic
  - Info/Explain command
  - Hierarchical config support
- SDE/Solido Integration

S-Edit
Regular Placement During Instancing

- **Core Functionality Boost:**
  - Cell > Instance now can define and place multiple copies of an instance in a grid arrangement (rows & columns)
    - Significantly increases productivity for repetitive placements
    - Aligning with competitive tools
- **Intuitive Placement Workflow:**
  - **Anchor Point:** 1st click to set the starting position
  - **Delta Definition:** User can either enter a step value or define it graphically in the schematic with the cursor
  - **Flexible Clicks:** 1-click (pre-defined step values), 2-click (1D), or 3-click (2D)
  - **Smart Preview:** Shown as the cursor moves



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S-Edit
Regular Placement During Instancing

- **Enhanced Instance Dialog (continued):**
  - Step values can be defined
    - By mouse click (set the value to 0)
    - Explicitly by setting the value in display units. Eliminates the mouse click.
      For example, 2D regular placement is typically 3-click operation. With explicit vertical step value,
      it is 2-click operation
    - Any changes to the fields in the dialog will reset the placement operations which will require
      the user to redo all mouse clicks
- **Operations Specifications**
  - Dynamic Preview Updates
    - The preview of the placement will adapt as you change the “step” value in the dialog
    - If you clear or set a step value to 0, the preview will adjust instantly, even reverting to a single instance if needed
      and so will the placement operation

S-Edit
Regular Placement During Instancing

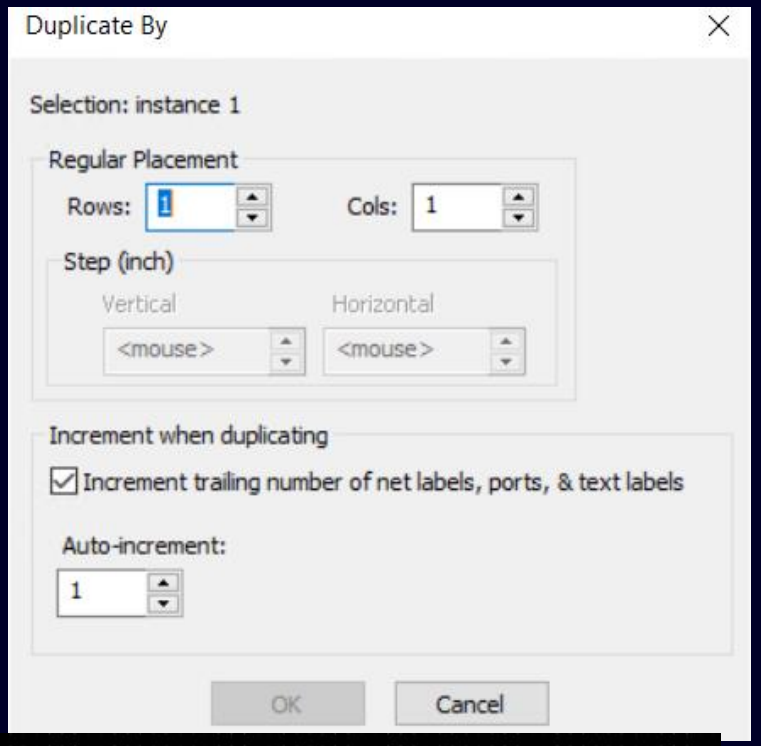
- **Operations Specifications (continued)**
  - **1D Horizontal Regular Placement:**
    - When you specify multiple columns (and 1 row), S-Edit will create a horizontal line of instances
    - If spacing isn't preset, it's a 2-click operation
      - 1st click → places the initial instance
      - 2nd click → defines the horizontal spacing (Delta X) for regular placement
  - **1D Vertical Regular Placement:**
    - When you specify multiple rows (and 1 col), S-Edit will create a vertical line of instances
    - Like the horizontal placement, spacing can be defined or not which defines how many clicks are needed
  - **2D Regular Placement:**
    - Multiple rows and columns will require 3 click for placement (if spacing isn't preset)
      - **1st Click**: Places the anchor point
      - **2nd Click**: Defines horizontal spacing
      - **3rd Click**: Defines vertical spacing, ready for placement

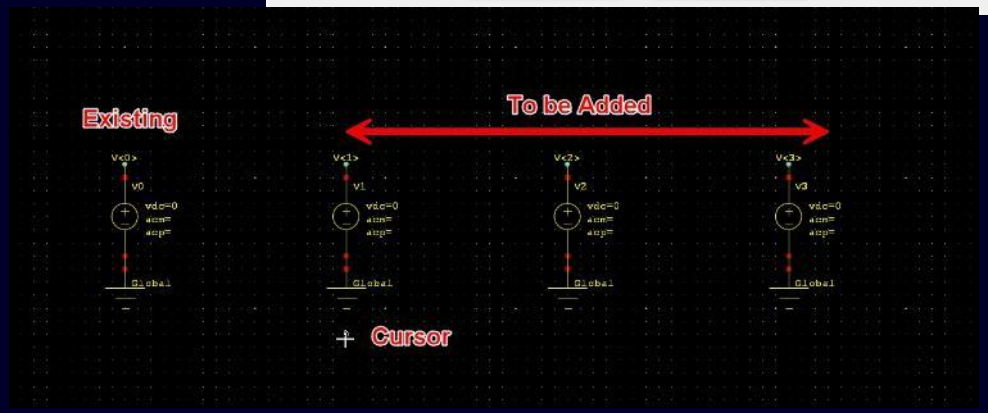
S-Edit
Regular Placement During Instancing

- **Instance Naming**
  - Must be unique
  - S-Edit uses the following rules:
    - **Numbered Instances:** Increment the last number found in the name (e.g., C1 → C2)
      - Note: This applies to array bits but not to array notation (X<1> → X<2> but C<1:3> → Error)
    - **Non-Numbered Instances:** Appends _C# (for cols in horizontal 1D) or _R# (for rows in vertical 1D)
    - **2D Regular Placement:** Always appends _C#_R# for non-numbered, or increments digits found in name (e.g., A11C → A12C)

S-Edit
Duplicate By As with Regular Placement

- **Duplicate By Command:**
  - Found under **Edit > Duplicate By...** (no default key binding)
  - Duplicates the selected objects into rows and columns, placing "N-1" copies relative to your initial selection (e.g., 99 copies for a 10x10 regular placement)
- **Control & Placement:**
  - Uses a modal dialog for setting rows, columns, and X/Y spacing.
  - Selected objects are the anchor, so only 1 click (1D) or 2 clicks (2D) are needed to complete operation
  - Step is set by mouse click or explicit value
  - Interactive preview as you move the mouse
  - ESC key cancels interactive placement





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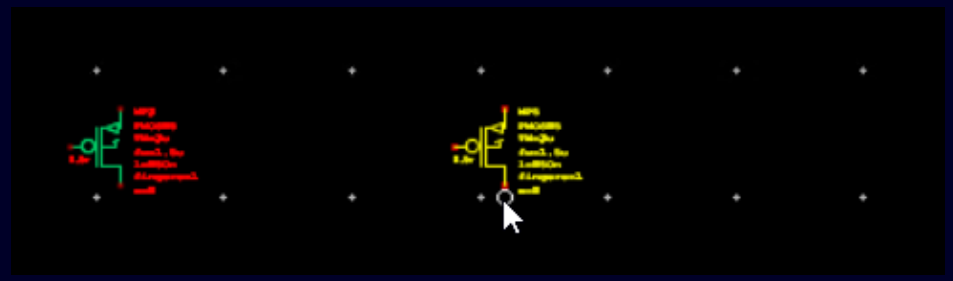
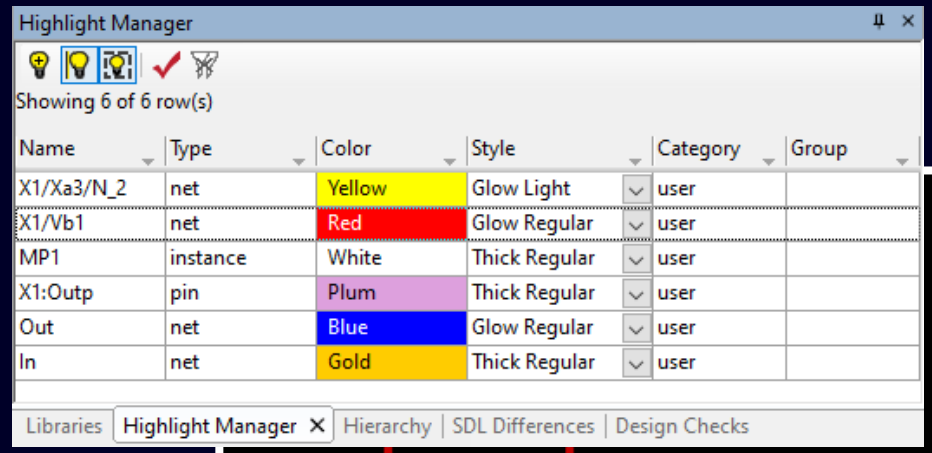
S-Edit
Duplicate By As with Regular Placement

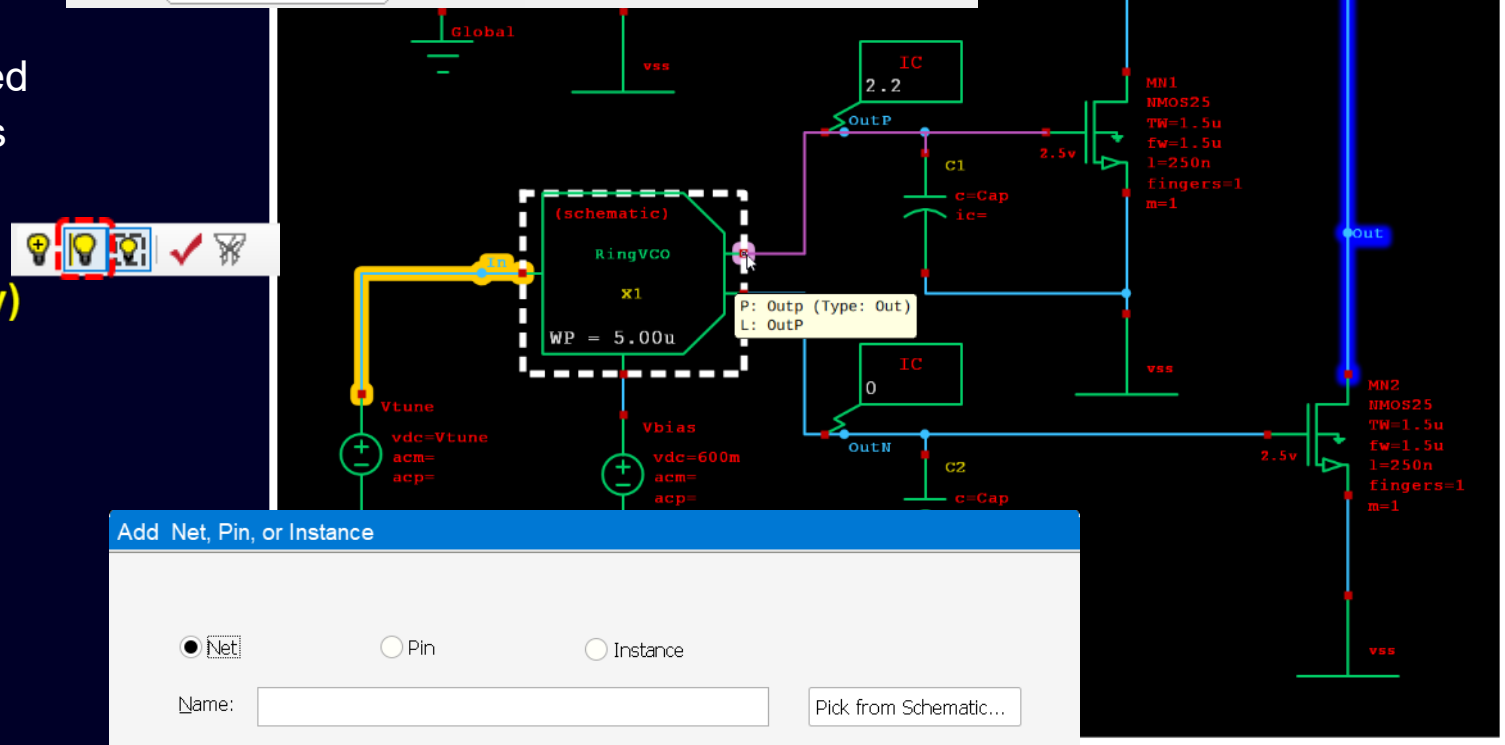
- **Naming & Uniqueness:**
  - Option to increment trailing numbers of net labels, text labels, and ports.
  - If instances are duplicated, S-Edit follows the same rules for creating unique instance name as the Instance dialog with regular placement (appending _C#, _R#, _C#_R#)
- **Optimized for Large Designs:**
  - Smart rendering for large duplications, showing only key elements to maintain performance and responsiveness (2x2 in the lower left and a copy at each corner (upper left, upper right, lower right).
  - Partial preview kicks in if both rows and cols >=3 or either one is >=6

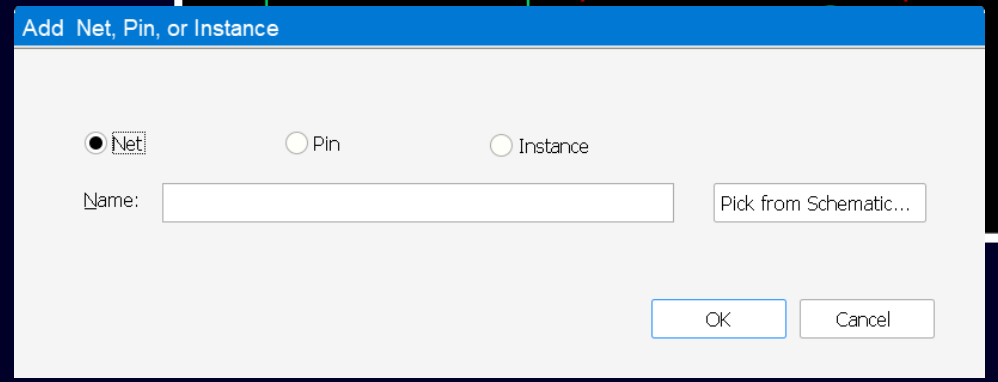


S-Edit
Enhanced Highlight Manager

- **The Net Highlight Manager has been renamed to the Highlight Manager:**
  - Through the Highlight Manager users can now highlight nets, pins, and instances
  - Users can select color and style - 5 pre-defined styles are available, but more customization is available via the Tcl command
  - Users can toggle the visibility of all highlights







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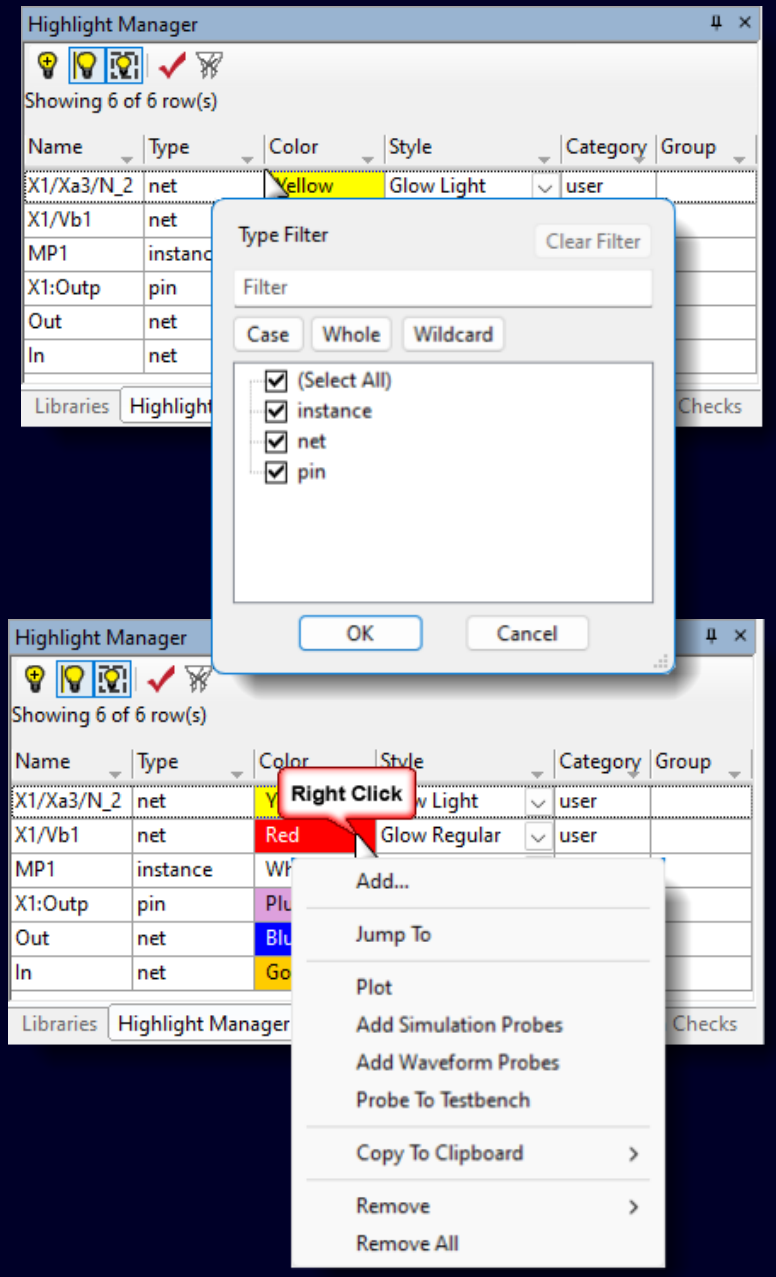
S-Edit
Enhanced Highlight Manager

- **Highlights can be added**
  - By the Highlight Manager
  - By the Highlight Net command/toolbar button
  - By Waveform Cross-probing (Schematic -> Waveform Viewer)
  - By Cross-Selection (Waveform Viewer -> Schematic)
- **Sort and Filter Columns**
- **Copied to Clipboard (in Tcl format) to be saved in a Tcl file for reuse**
- **New category field indicates the purpose of the highlight (Waveform Cross-Probing entries get added as Simulation category)**
- **Add Simulation Probes – Adds entries for all simulation plot items from either the Output pane in SDE or the Results pane in the setup simulation for TDE**
- **Add Waveform Probes – Adds entries for all currently plotted waveforms of a net or a pin current**
- **Plot / Probe to Testbench – Plot the selected user highlight or add it to the simulation setup to be plotted every time you simulate**



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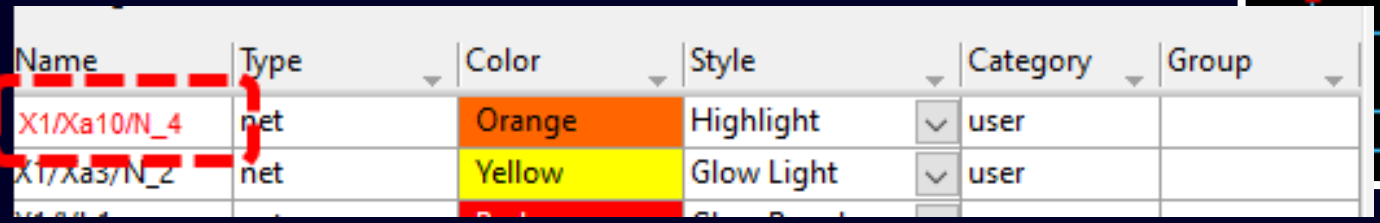
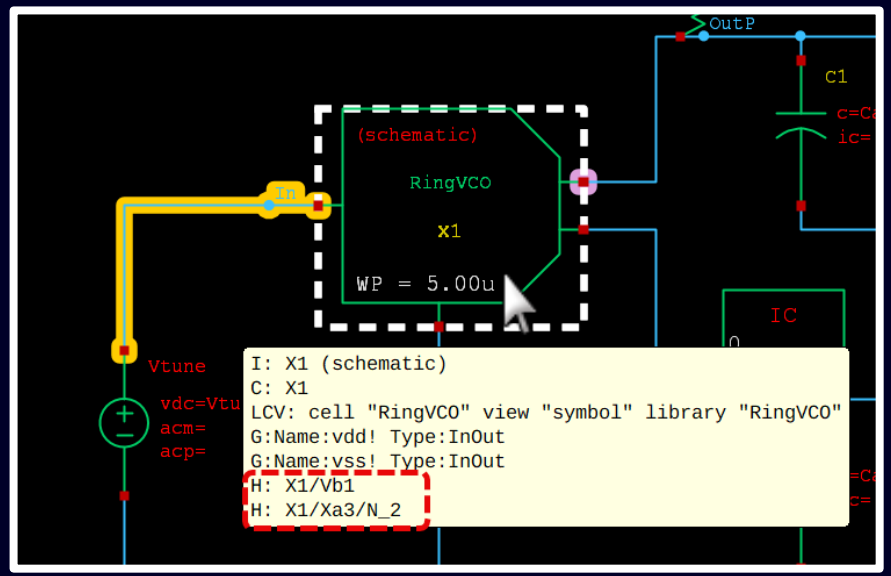
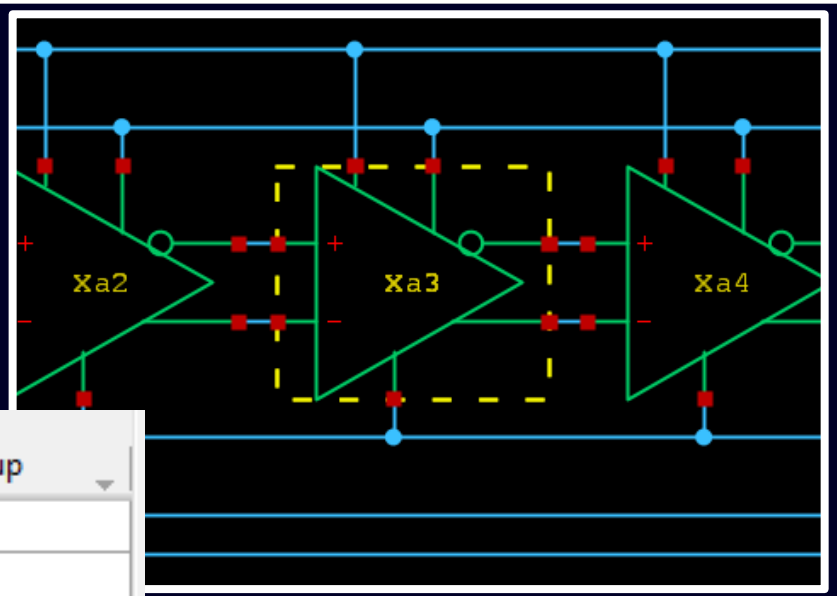
S-Edit
Highlight/Probe Reflections

- **Instances are highlighted with a dashed box to let the user know there are highlights down that hierarchical path (Highlight Reflection):**
  - Bold white dashed box means multiple highlights exist with details in the tooltip
  - Regular dashed box means one highlight exists and the color of the box is the same as the highlight color

  - Users can toggle the visibility of Highlight Reflections
  - Highlights are per design and not specific to a cell, so if you highlight the Vdd net, any cell you open that has the Vdd net will be highlighted with the same color and style
    - The highlight manager shows all highlights per design, and some highlights may not have context/exist in the active view
    - Users can run a check, and it will display the highlight name in red for those highlights that do not exist in the current active view or its hierarchy







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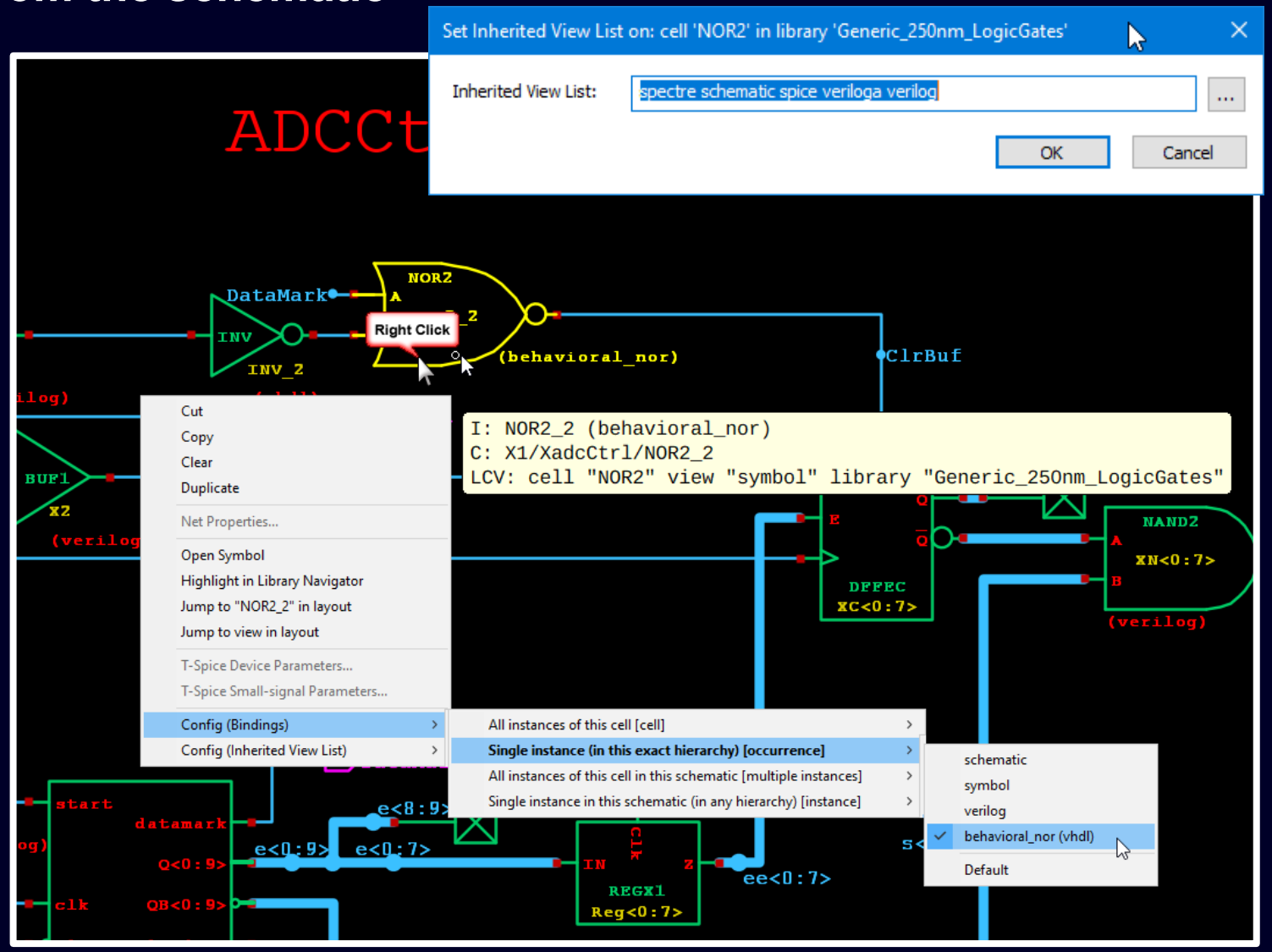
S-Edit – Hierarchy Editor
Set binding for config views directly from the schematic

- **Users can set cell binding, instance binding, or occurrence binding for config views directly in the schematic as a more convenient way to setup config views**
  - Slow right click on the instance
    - All instances of this cell (cell binding)
    - Single instance (in this exact hierarchy) (occurrence binding)
    - All instances of this cell in this schematic (multiple instances binding)
    - Single instance in this schematic (in any hierarchy) (instance binding)
  - Inherited View Lists can also be set in the schematic



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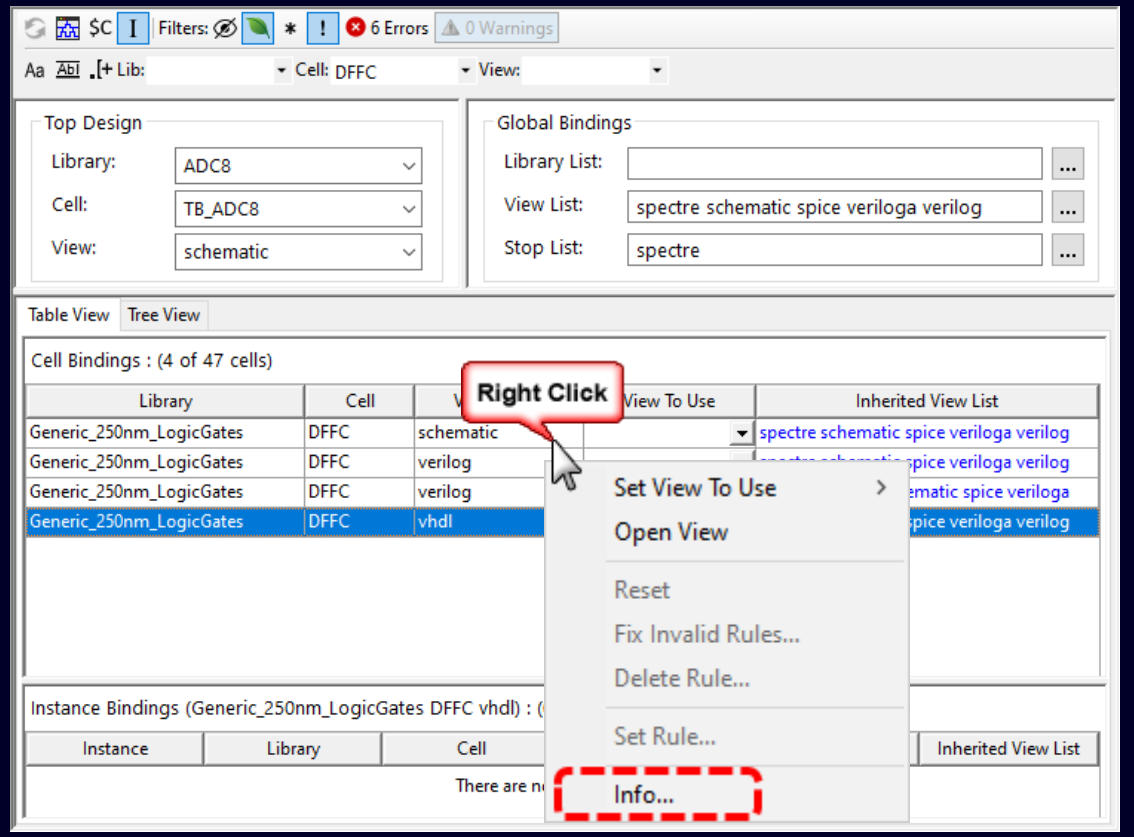
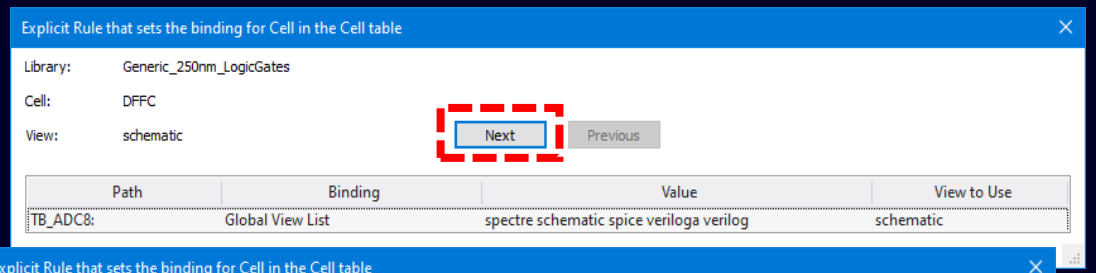
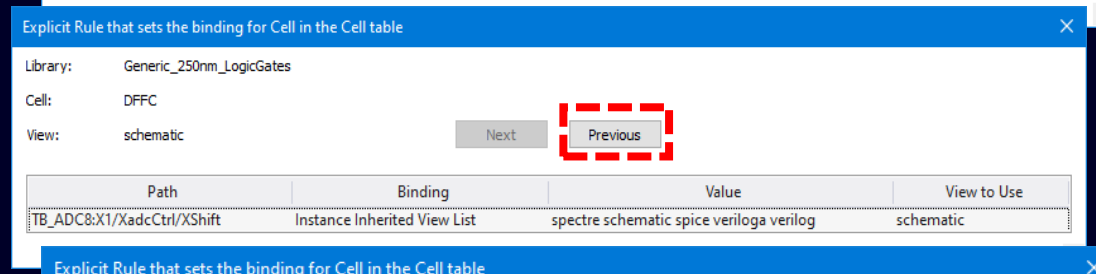
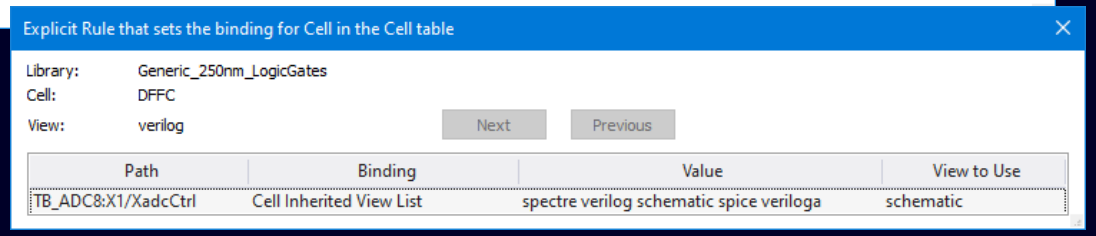
S-Edit – Hierarchy Editor
Info (Explain command)

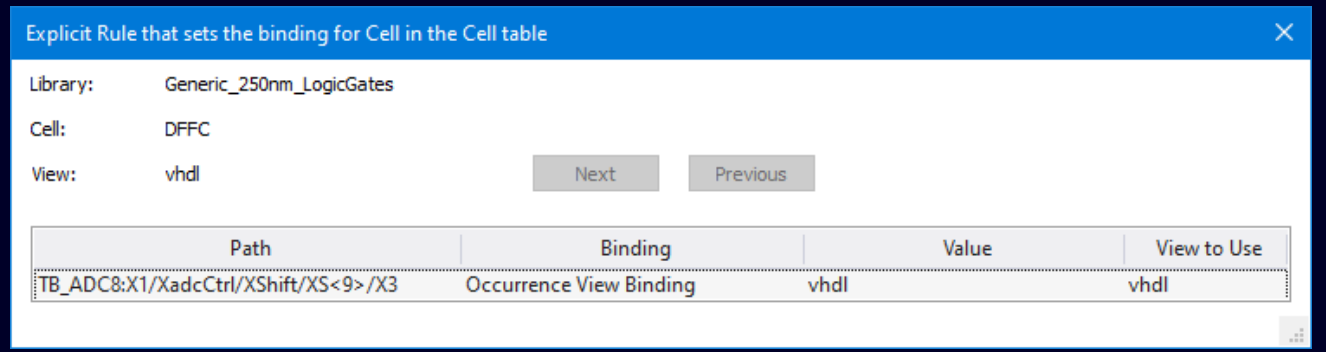
- **Users can use the Info command to understand how a particular Cell's, Instance's, or Occurrence's binding was set based on the rules that affect it (through view lists and explicit binding) in the config view**
  - If multiple rules affect the binding, you can step through them to debug complex bindings, inheritance, and rule precedence











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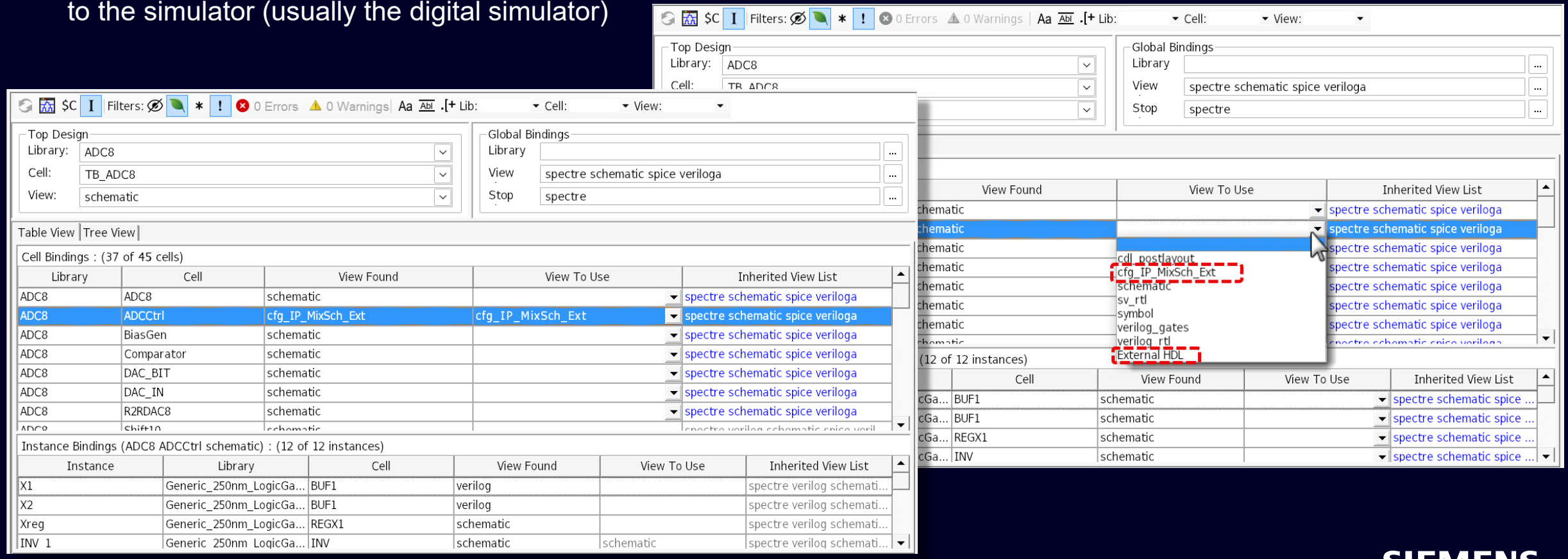
S-Edit – Hierarchy Editor
Hierarchy Config Support

- **Users can use config views as bindings which is useful for complex IP which has predefined config views**
  - Bindings set by a config view are read-only and cannot be changed
  - Users can also bind via External HDL to indicate that the view will be external and the user will provide the implementation to the simulator (usually the digital simulator)



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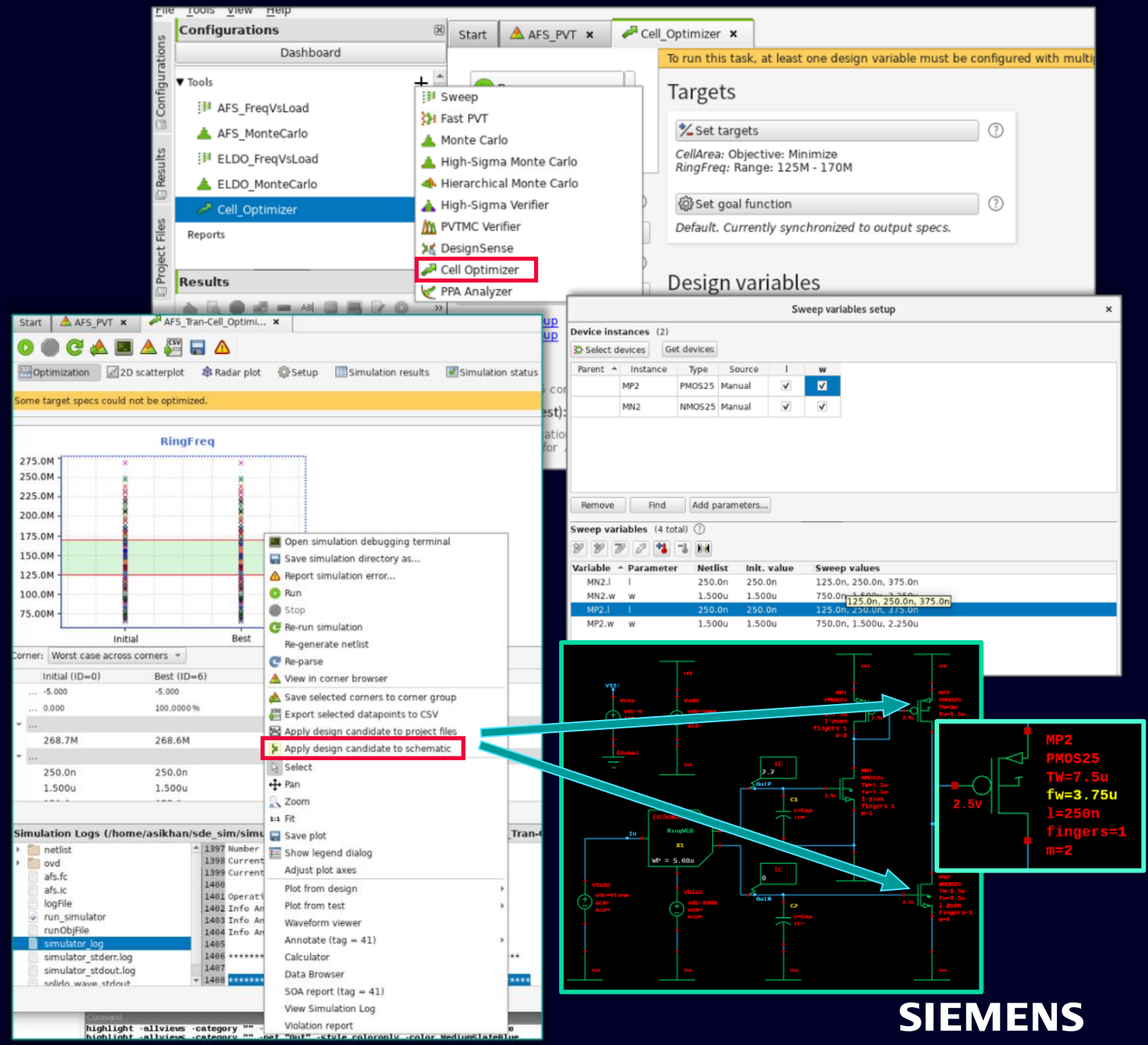
SDE/Solido Integration

- **Probing enhancements**
  - When picking nets and pins in the schematic for plotting from SDE Output pane, now use new highlight style of glow for net and thick for pins.
  - Various other ways to select information from the schematic from SDE Test panes, now use new highlighting styles.
- **Cell optimizer support**
  - When running the Cell Optimizer in Solido DE, users can now back-annotate optimized parameters back to the schematic.



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Layout Design and Physical Verification

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L-Edit New Features Overview

- Improved Editing
  - Performance improvements
  - Edge Selection
  - F3 Instance Cell
  - F3 Draw Wire
  - Multipart Path (MPP)
- Improved Design Debug
  - Highlight Connected
  - Dimming
  - Pick at Point
- Connectivity Driven Design
  - Schematic Driven Layout
  - Engineering Change Order
  - Interactive Router – point to point

L- Edit
Performance Improvements

- Significant performance improvement have been made across the flow
- Focus on improving usability while editing
  - Pan
  - Zoom
    - When zooming in
      and
    - When zooming out
  - Selection (drag box and click)
- Improvements on large layout (100 million objects and more)
  - Selection
  - Moving
  - Deleting
  - Object snapping
- And many others

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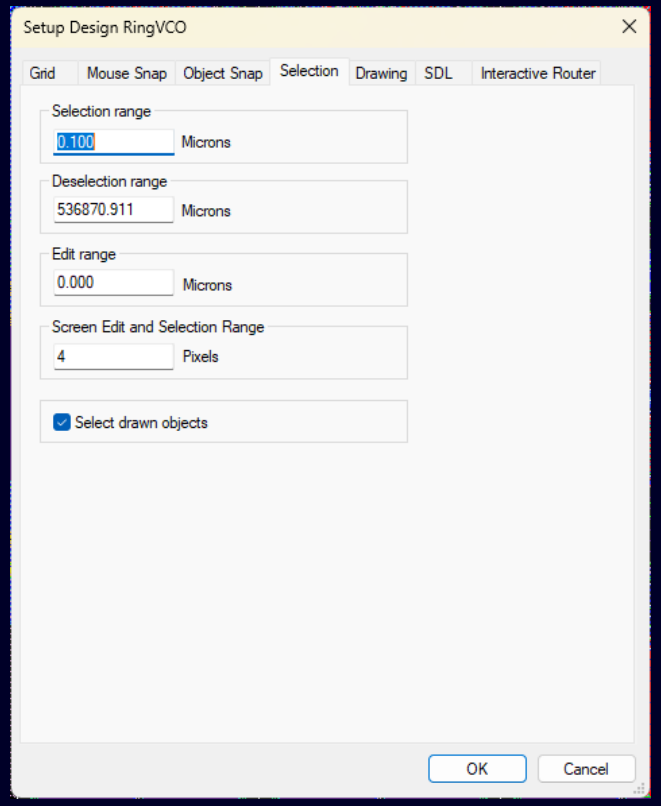
L- Edit
Edge Selection

- Improved Edge Selection for both high and low zoom levels
- Selection distance was controlled by Setup > Design... > Selection > Selection Range (in microns)
- Now the selection distance is the max of the Selection Range (in Microns) and the Screen Edit and Selection Range (in pixels, previously called "Edit Range")



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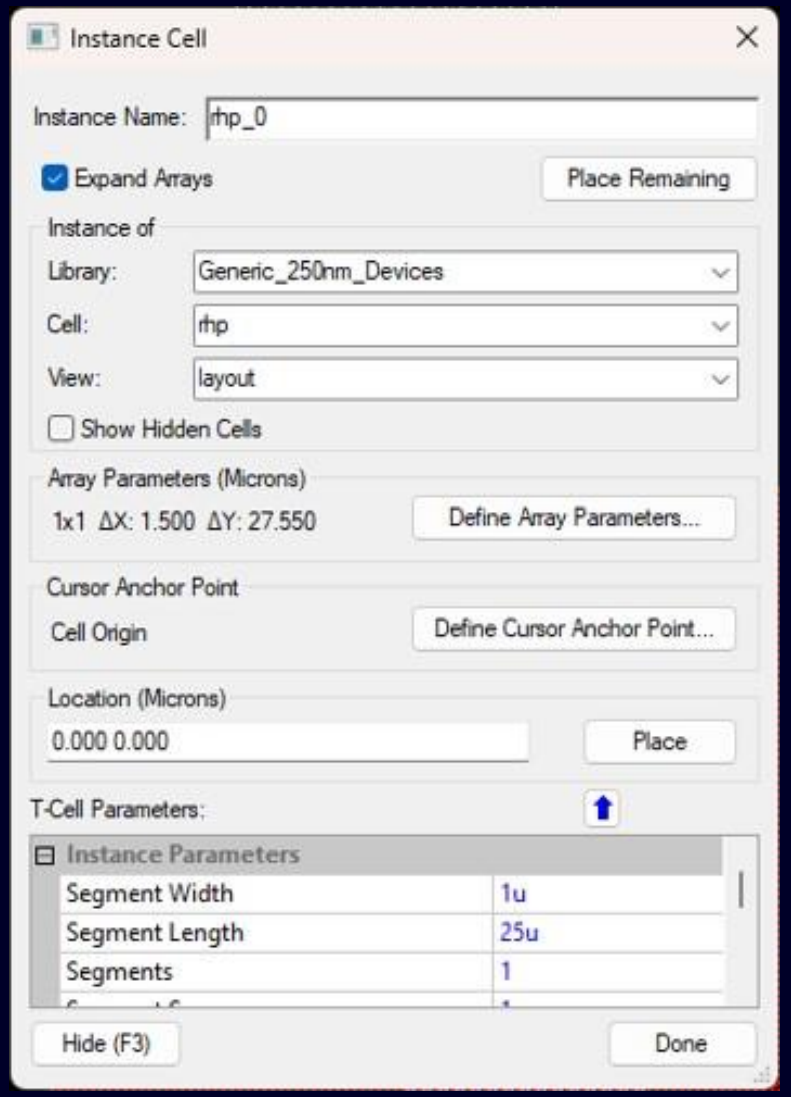
L- Edit
Instance Cell

- Enhanced F3 Modeless Dialog
  - Change settings more easily while instancing to place with correct parameters at correct location
    - Saves from multiple Edit Objects or move operations after the instance is placed
  - Place multiple instances without restarting the command
- New Functionality
  - Instance names conflict dialog
  - Preview of Instance/PCell/Array during placement
    - Shows more detail based on the object count in the instance
      - User can still press TAB to see alternate views



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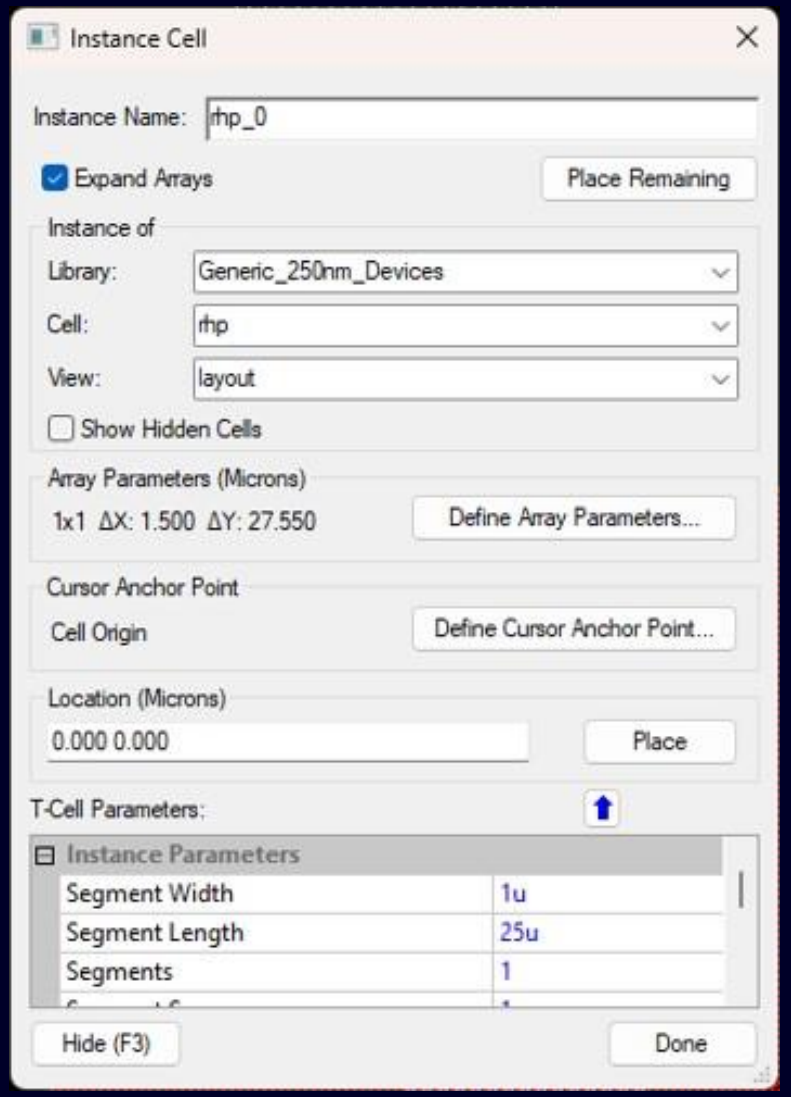
L- Edit
Instance Cell

- Settings
  - Instance Name or Multiple Instance Name (space separated)
    - Support for array notation
  - Expand Array - If Instance Name is an array, place them one instance at a time, updating the name
  - Place remaining instances from list based on delta of the last two instances
  - LCV of cell to instance
  - Define Array Parameters
    - User sets Repeat Count and Delta
  - Pick Anchor Point of the instance on the cursor
    - User can set to Cell Origin, or a reference location on the Cell MBB, Cell Abut, or Pin
  - Place instance at specific coordinate location
  - T-Cell Parameters



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L- Edit
Draw Wire

- Enhanced F3 Modeless Dialog
  - Change settings more easily while drawing wires to adjust settings before drawing
    - Saves user from needing to use Edit Objects after the wire is drawn
- New Functionality
  - Wire Width can pull from PDK technology or Setup Layer default
  - Multipart Paths (MPPs) can be drawn (see slide on MPPs)

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L- Edit
Draw Wire

- Settings
  - Type can be set to draw wires or MPPs
  - Layer – LPP of the wire to be drawn
  - Net – Optional net name for the wire
  - Wire Width – Width of wire in display units
    - RMB click to reset to defaults from PDK technology or Setup Layers
  - End Style
    - RMB click to reset to defaults from Setup Layers
  - Join Style
    - RMB click to reset to defaults from Setup Layers
  - Angle
    - Enabled when Join Style Miter is used
    - RMB click to reset to defaults from Setup Layers

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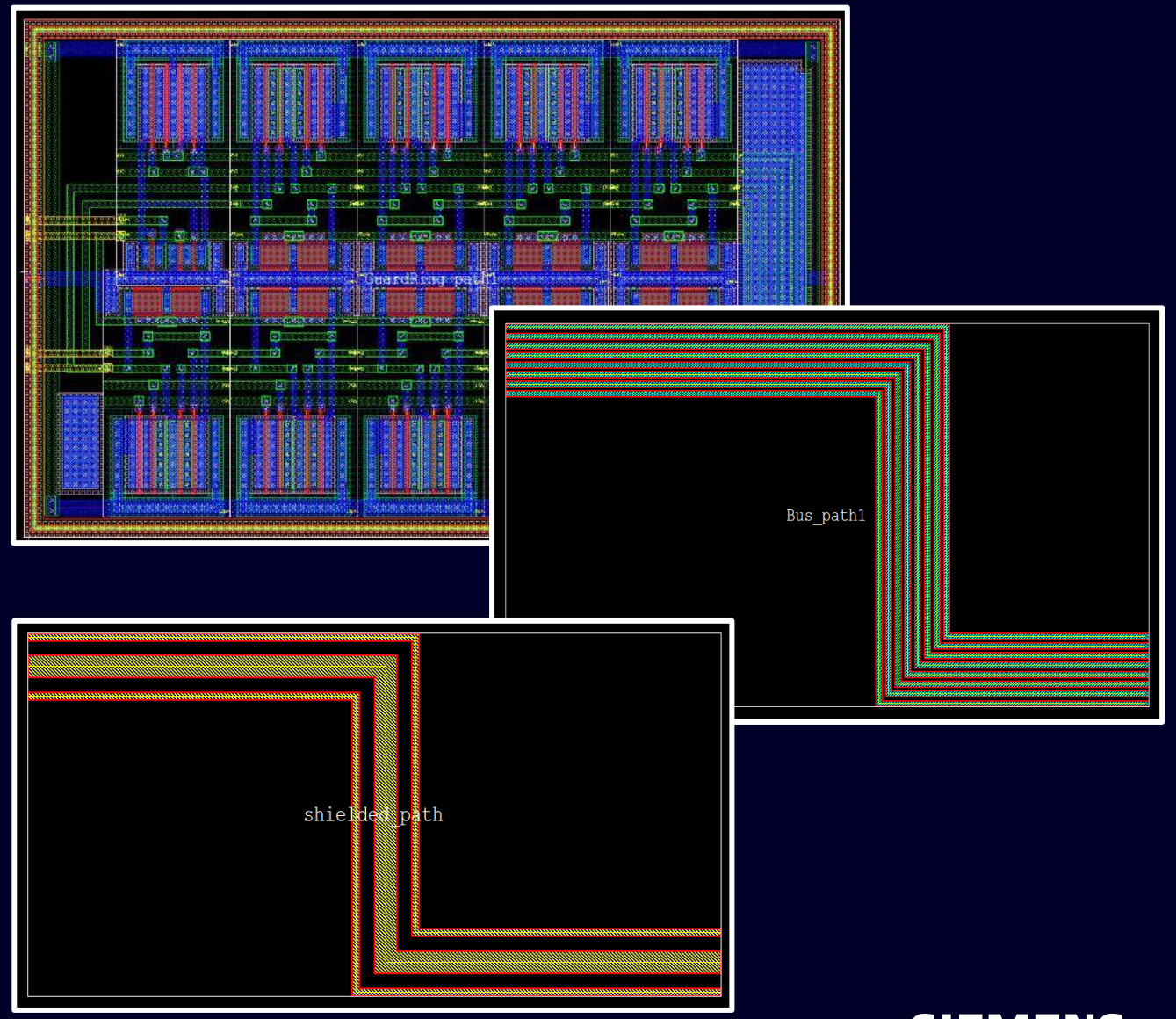
L- Edit
Multi-Part Path

- Reusable Structures
  - Facilitates creation of layout templates for common analog patterns (guard rings, buses, shielding, contact arrays)
    - User draws main path points and all other required subpaths are created automatically for user as was defined
- Improved Productivity
  - Reduces manual effort in drawing complex structures
    - User can define once and save as MPP template
    - Can be configured as user is drawing without a template
- Drawn/Edited like wires
- Chop and Heal
  - Can Heal chopped regions
- Legacy Guard Ring Templates will be automatically converted into new MPP Templates



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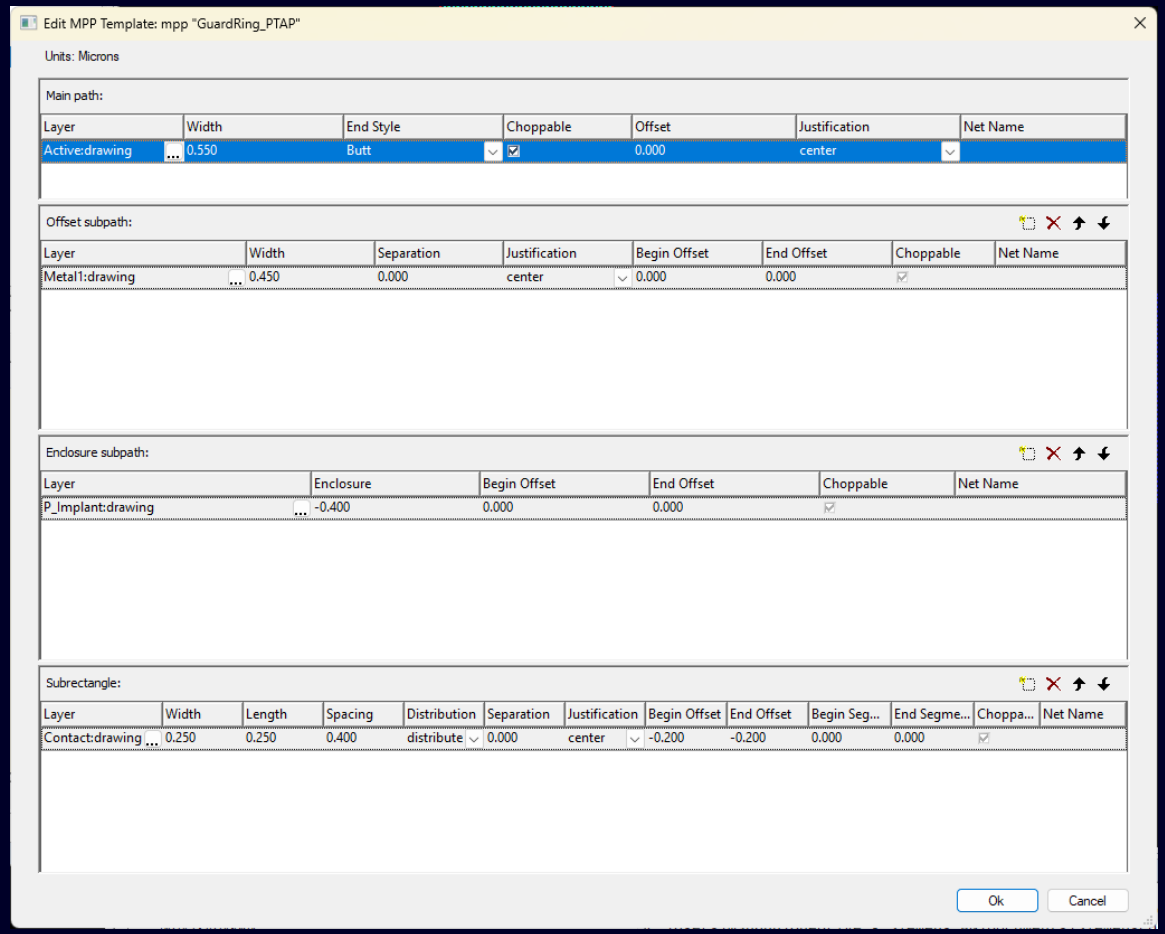
L- Edit
Multi-Part Path

- MPPs contain
  - Single Main Path
    - Main Path is defining object
  - One or more Subparts
  - Exist in relation to the Main Path
  - Treated as a single object (group)
  - Can define any number of subparts of the following type
    - Offset subpath
    - Enclosure subpath
    - Subrectangle



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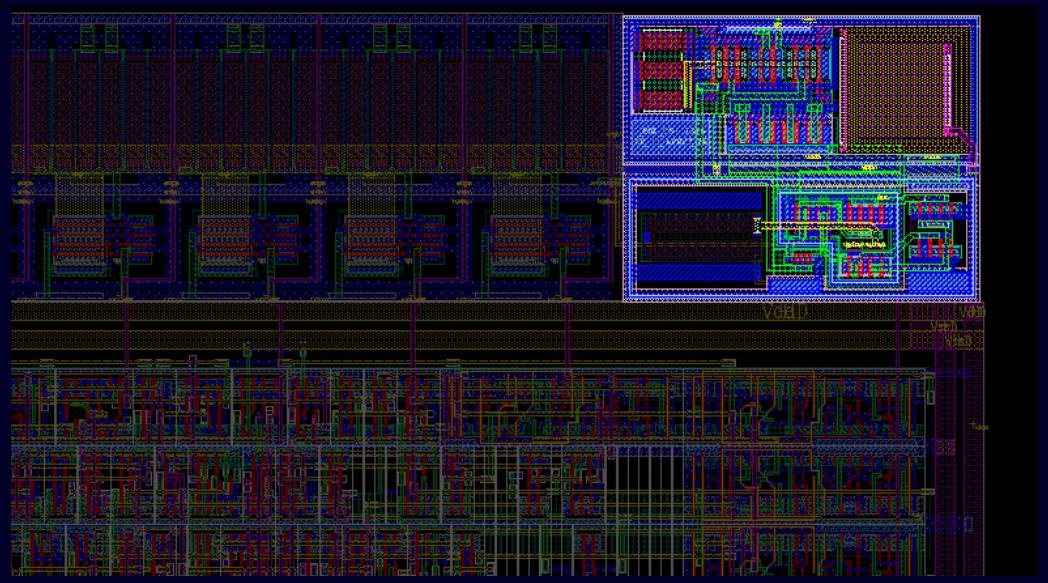
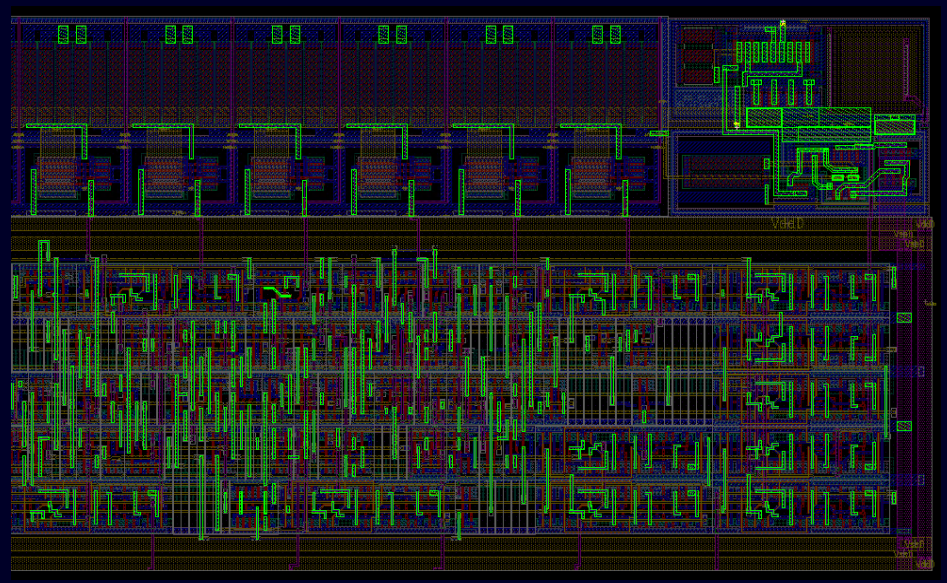
L-Edit
Dimming

- Portions of the layout can be dimmed with respect to the rest of the layout view
- Examples:
  - Edit in Place
  - By layer
- Dimming intensity - Controlled by the dimming slider on the status bar



Edit in place



All layers dimmed but Metal 2

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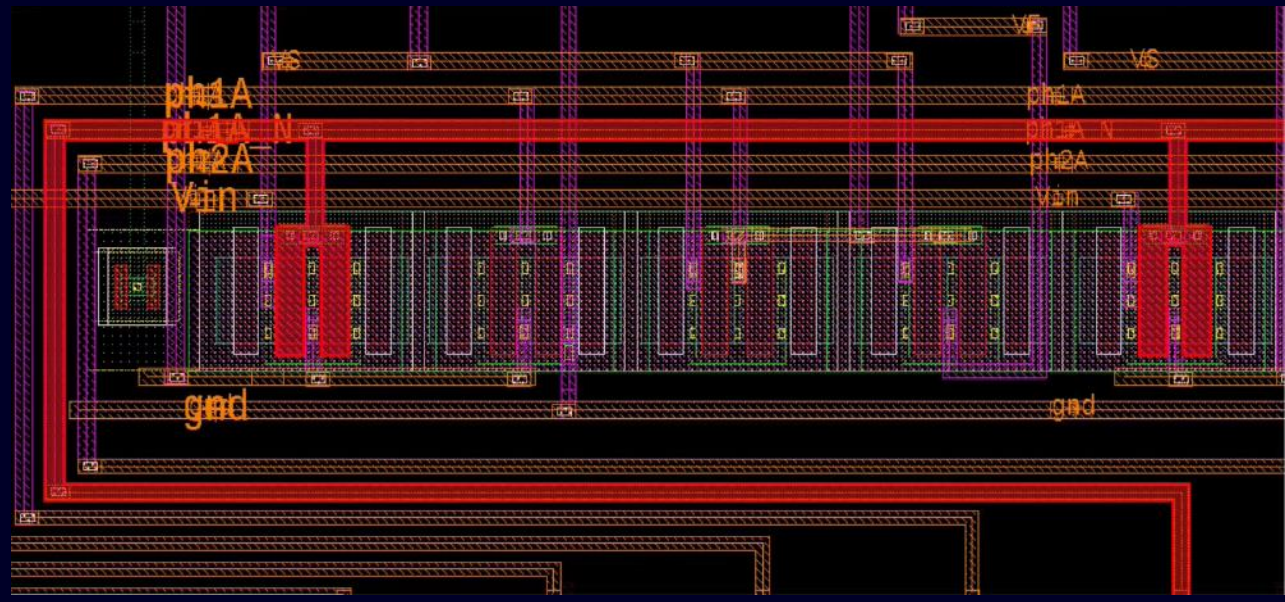
L-Edit
Highlight Connected

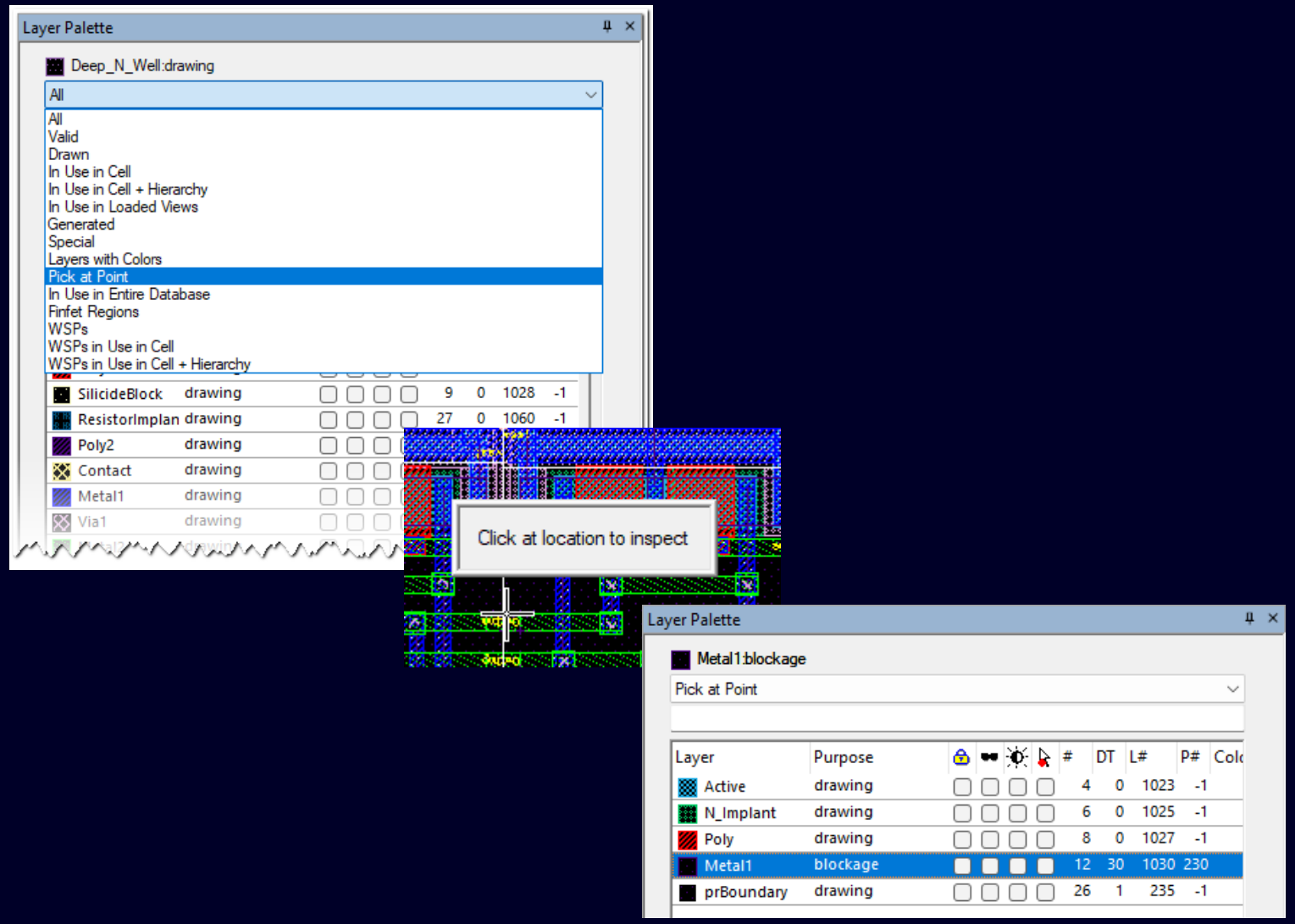
- Traces and highlight the connectivity of a selected shape trough the design hierarchy
- Can also trace a net by its name
- Doesn't require prior connectivity extraction
- Traces a large net more than 10X faster than extracting the connectivity of the design
- Uses the connectivity rules from the PDK OA tech or the Tech layer setup
- Supports advanced nodes: Multi-Patterning, MEOL and trim layers
- Can trace and highlight a net by steps, with user definable step sizes
- Command is interruptible
- Works outside of Schematic Driven Layout environment
- ***Licensing*** – L-Edit IC EE required for this new feature



SIEMENS

L-Edit
Pick at Point

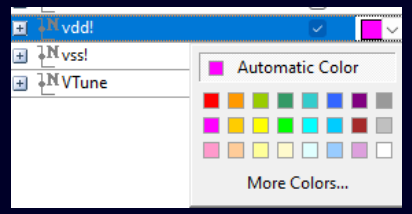
- New Filter in Layer Palette
  - Prompts user to click at point in layout
  - Only layers below the chosen point are displayed in the layer palette



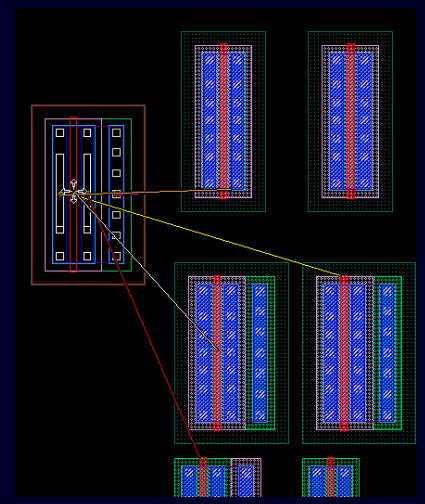
SIEMENS

L-Edit
Schematic Driven Layout/Engineering Change Order

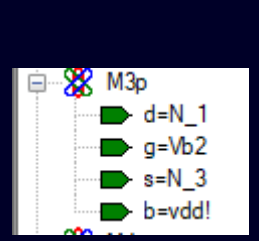
- Drag-and-drop from SDL Browser
- Flyline
  - Dynamic flylines – appear on instance or port being moved
    - Flyline updates dynamically as the object moves
    - Single instance or port selection only
  - Show Connected Flylines
    - On instance, it turns on flylines for all nets connected to the instance's terminals
    - On instTerm or port, it turns on flyline for the net connected
  - Change flyline color

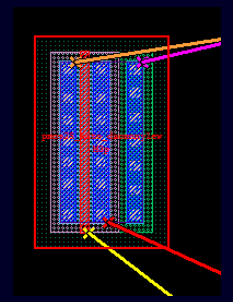


Change flyline color



Dynamic flylines on instance being moved





On M3p, RMB > Show Connected Flylines: turns on flylines connected to M3p's terminals

On insTerm:g, RMB > Show Connected Flylines, turns on flyline connected to g-terminal

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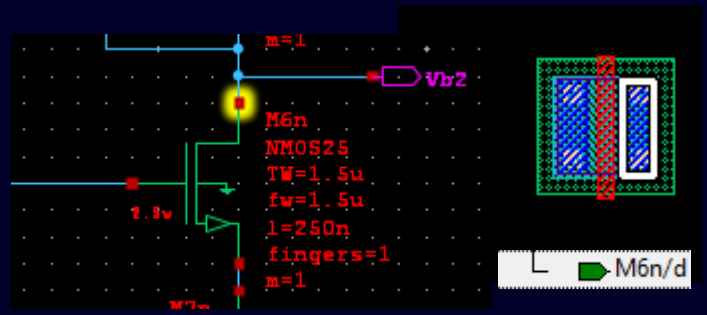
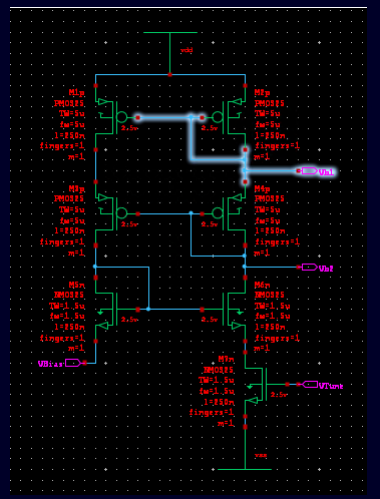
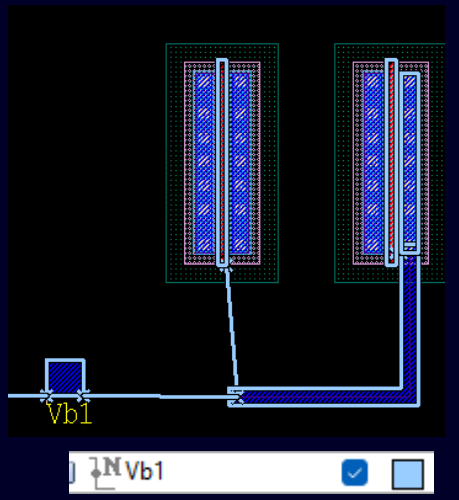
L-Edit
Schematic Driven Layout/Engineering Change Order

- SDL Cross-probing
  - Similar to flyline color, cross-probing color can now be changed and customized in a similar fashion
  - Cross-probing to schematic now highlights the schematic net with the same color as the layout net
  - Instance terminals can now be cross-probed and highlighted in both layout and schematic
  - Clear existing highlights option added to cross-probing
  - Option to include or exclude flyline rendering when cross-probing a net
  - SDL options shortcut added to SDL toolbar button



InstTerm cross-probing





Cross-probing to schematic highlights schematic net with the same color as layout net

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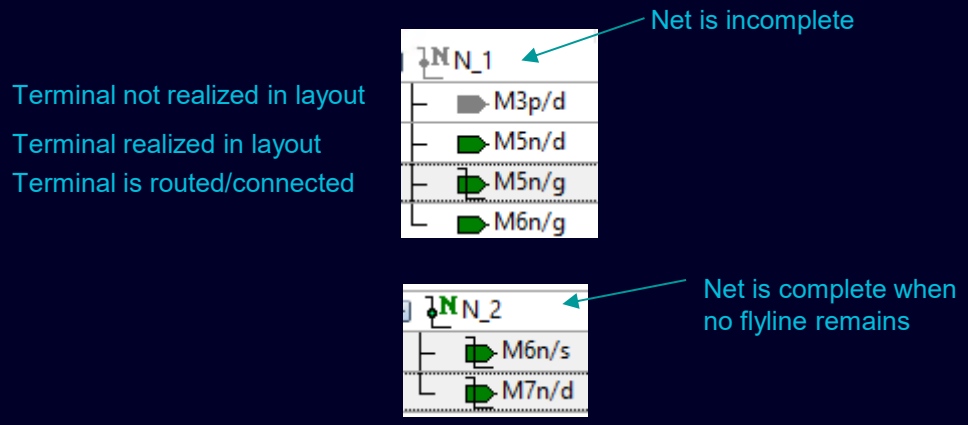
L-Edit
Schematic Driven Layout/Engineering Change Order

- Terminal status and net completion status
  - Terminal status
    - Not realized in layout
    - Realized / Placed in layout
    - Is routed/connected
  - Net completion status – complete and incomplete
    - Show Incomplete Net Info context menu displays number of remaining flylines in paratheses next to the flyline visibility column
- Status updated automatically after running interactive router, or by running Extract Connectivity
  - Known issue: flyline count displayed by Show Incomplete Net Info is not being updated automatically with interactive router or Extract Connectivity. (to be addressed in update release)



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L-Edit
Schematic Driven Layout/Engineering Change Order

- SDL Mapping
  - Option to update layout instance name to match schematic when performing SDL Mapping
  - Check if layout instance has the same master as schematic
  - Support multiple selection of logic instances from the instance list and multiple selection of layout instances from the unmapped list to perform mapping

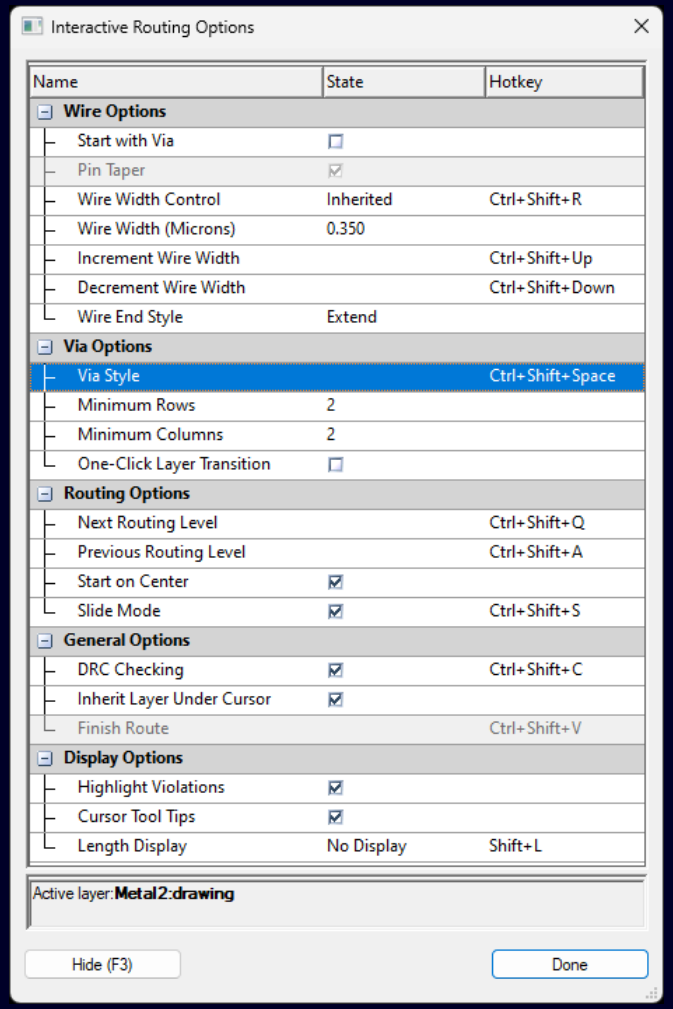
- Shorts Checker
  - Shorts checking is run automatically when Extract Connectivity is run. It checks all nets
  - Shorts checking on specific nets can be run on demand from the By Net view context menu
  - Shorts information such as net anchor, short location and shorted connection are displayed in Verification Navigator for shorts debugging

L-Edit
Schematic Driven Layout/Engineering Change Order

- ECO
  - Push engineering change orders to existing layout from S-Edit
    - Click the same Create Layout button  and choose an existing layout view
  - Auto-fix enhancements
    - Enhanced m-factored device auto-fix handling
    - Missing in layout – auto-fix adds the specified items below the bounding box of the current layout

L-Edit
Interactive Router

- Added Single Custom Via Support
  - Custom via arrays will be supported in a future release
- F3 Dialog
  - New “One-Click Layer Transition” feature
    - Starts perpendicular wire after via without extra click
  - Dynamic Text Displays Wire Width
  - Reorganized F3 dialog options and sections
- Mirror Routing
  - Waits for click in canvas to start routing
    - Allows for Start with via
    - Pin closest to cursor will be control pin
      - Rendered with +
- Pin snapping markers highlight when hovering mouse over ports



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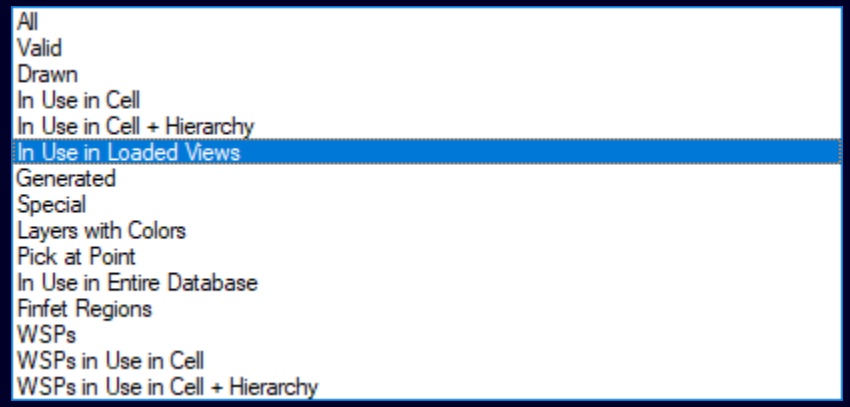
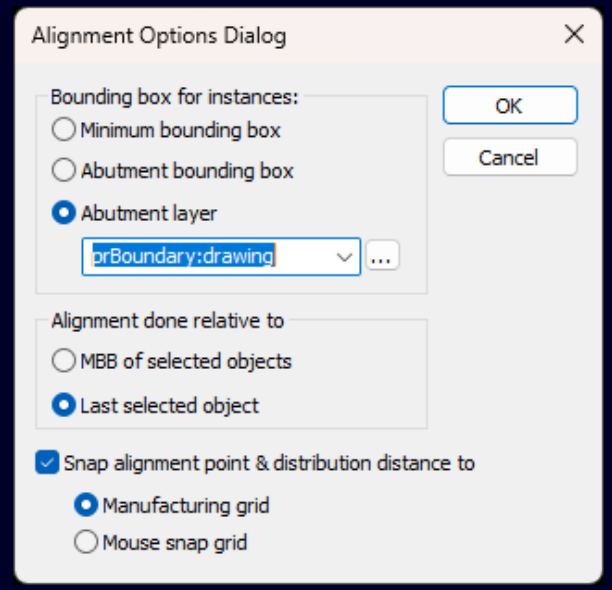
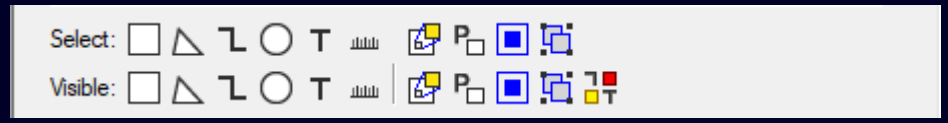
L-Edit
Additional Enhancements

- Pan with Middle Mouse Button using Z key
  - Direction was changed to be consistent with S-Edit
  - Tcl variable `custom_ic_revert_pan_direction` set to 1 will switch back to previous direction
- Layer Palette Options
  - **In Use in Loaded Cells** added
  - **In use in File** renamed to **In use in Entire Database**
    - Now interruptible
- Cellnames in Library Navigator are now aligned regardless of whether they have an icon
- LEF Antenna extraction now operates with a Calibre One license
- Added alignment option choice to align to a specified layer for instances
- Boxes, Polygons, Wires, Circles, Pie Wedges, Tori and Rulers may now be enabled or disabled for selection
  - Previously this was only available for Ports, Vias, and Instances







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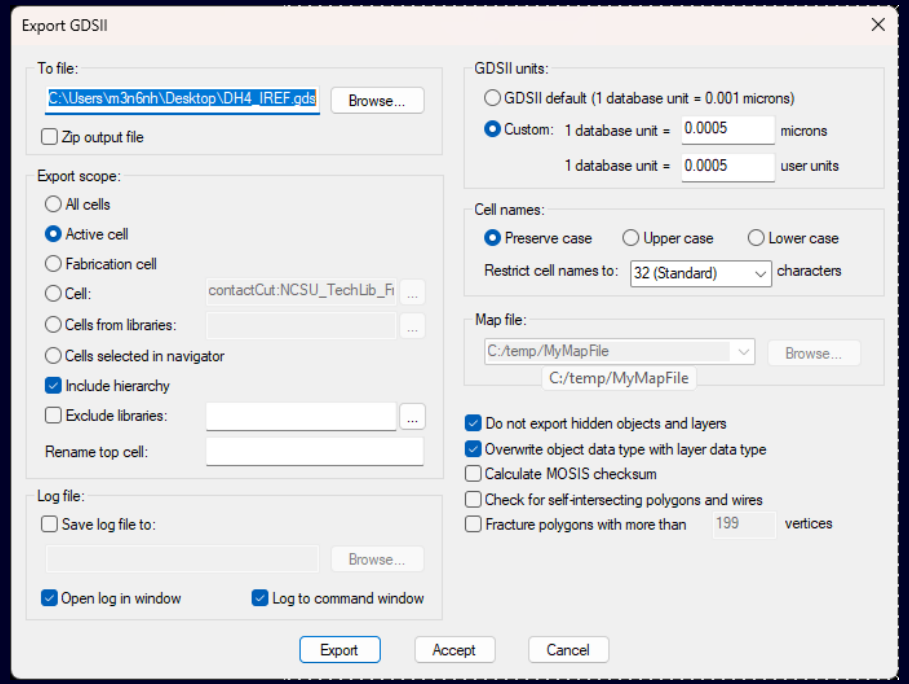
L-Edit
Additional Enhancements

- GDS and Oasis layermap import and export
  - Now saved on a per-design basis
  - Tcl variable added to allow setting of layermap import/export to take precedence over GUI setting
    - `custom_ic_layermap` – Sets the map file for OASIS and GDS import and export. This has precedence over legacy `tanner_layermap`.
    - `custom_ic_oasis_import_layermap` – Sets the map file for OASIS import only. This has precedence over `custom_ic_layermap` and legacy `tanner_layermap`.
    - `custom_ic_oasis_export_layermap` – Sets the map file for OASIS export only. This has precedence over `custom_ic_layermap` and legacy `tanner_layermap`.
    - `custom_ic_gds_import_layermap` – Sets the map file for GDS import only. This has precedence over `custom_ic_layermap` and legacy `tanner_layermap`.
    - `custom_ic_gds_export_layermap` – Sets the map file for GDS export only. This has precedence over `custom_ic_layermap` and legacy `tanner_layermap`.



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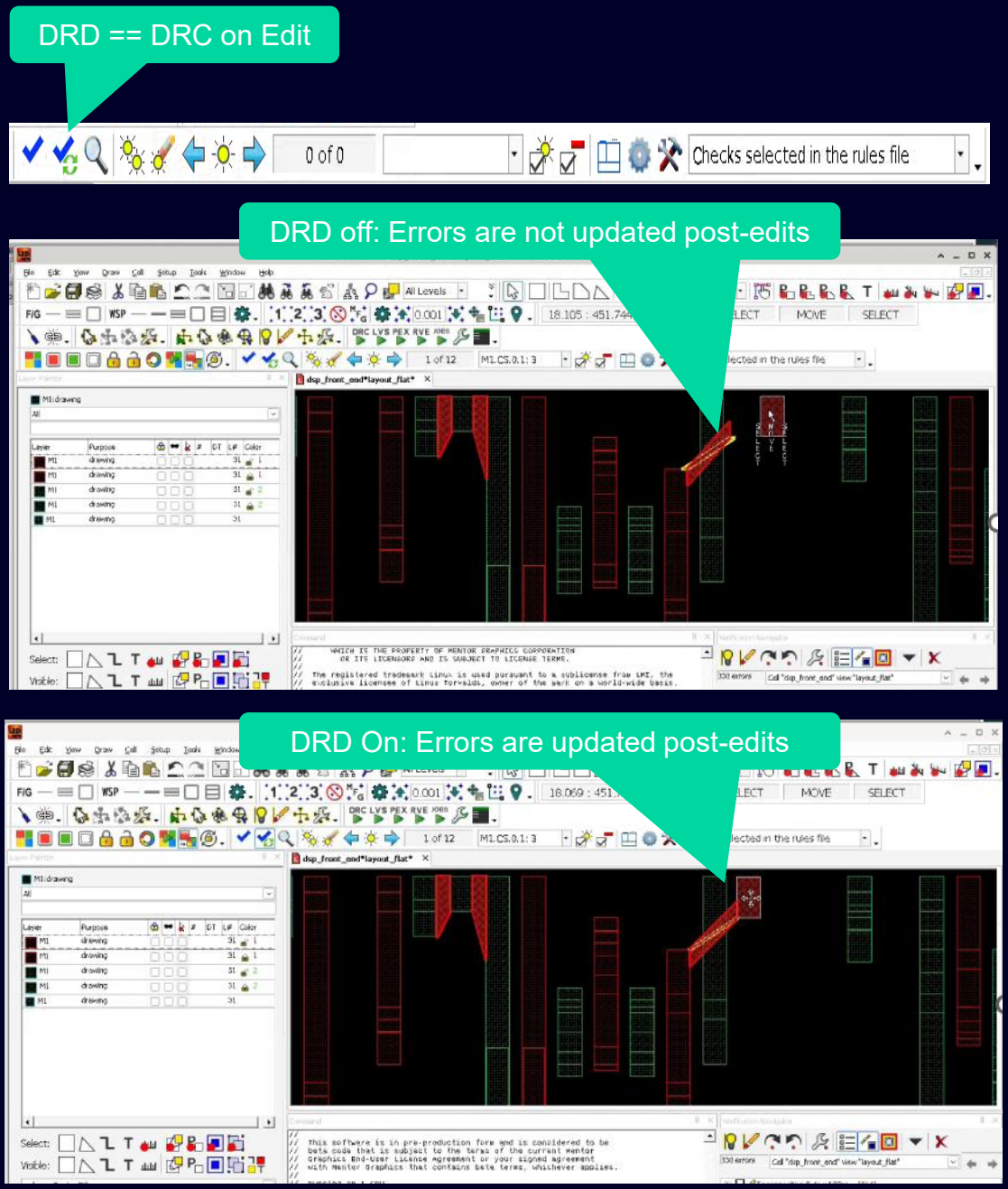
L-Edit
Additional Enhancements

- New UPI function to simplify process of binding functions to menu items and hotkeys across three different interpreters: C++, Python, and Tcl
  - Provides unified approach to binding across different interpreters
  - `unsigned int LEDITAPI LMacro_BindToMenuAndHotKey_v2025(const char* szMenu, const char* szHotKey, const char* szMacroDescription, const char* szFunctionName, const char* szHotKeyCategory, TMacroType cnMacroType);`

Calibre RealTime Enhancements
L-Edit DRD (DRC-on-Edit)

- Goal:
  - Interactive checking of Calibre physical checks post-edit events
- Main Features:
  - Support multiple edit events for different components (wire, polygon, device, via, pin, … etc)
    - Component Creation (add, duplicate, …)
    - Component Edit (Move, Stretch, …)
    - Coloring Invocation (assignment, cycle, automatic coloring, …)
  - Allow selection of DRC deck and its settings from Calibre Realtime Custom (RTC) GUI settings
  - Known limitation/Future enhancement:
    - Single deck invocation is only allowed.
    - Multiple deck configurations is not supported
    - Serial invocation of multiple- deck is not supported yet



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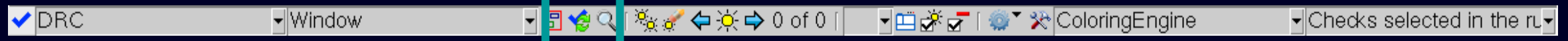
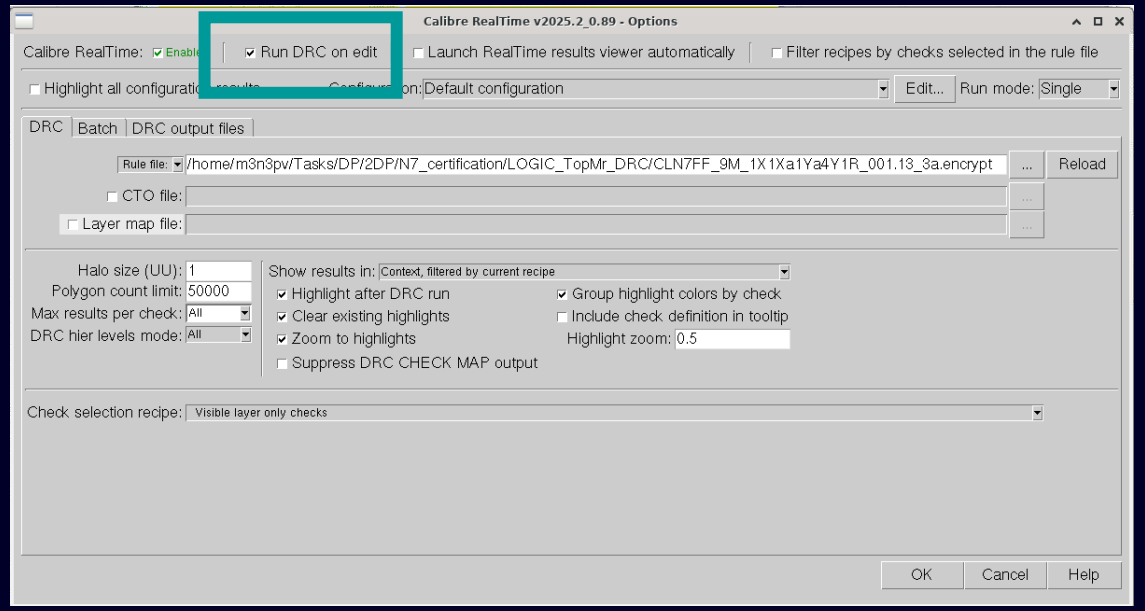
Calibre RealTime Enhancements
L-Edit DRD (DRC-on-Edit)



- Name: “DRC on Edit” a.k.a DRD “Design Rule Driven” checker.
- Scope: productivity
- Description:
  - Interactive checking to invoke Calibre deck(s) post-edit.
  - This is very useful to factor in the impact of many geometrical rules (even across many Calibre geometrical flows) for every edit



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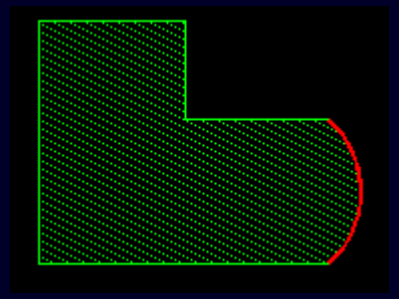
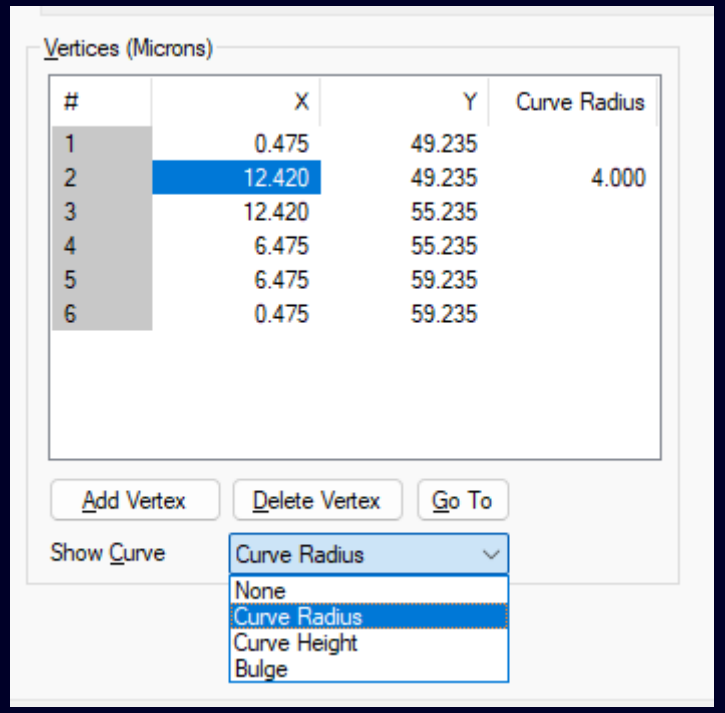
More Than Moore

- MEMS
  - Edit Object dialog displays curves as a radius or a bulge in addition to curve height





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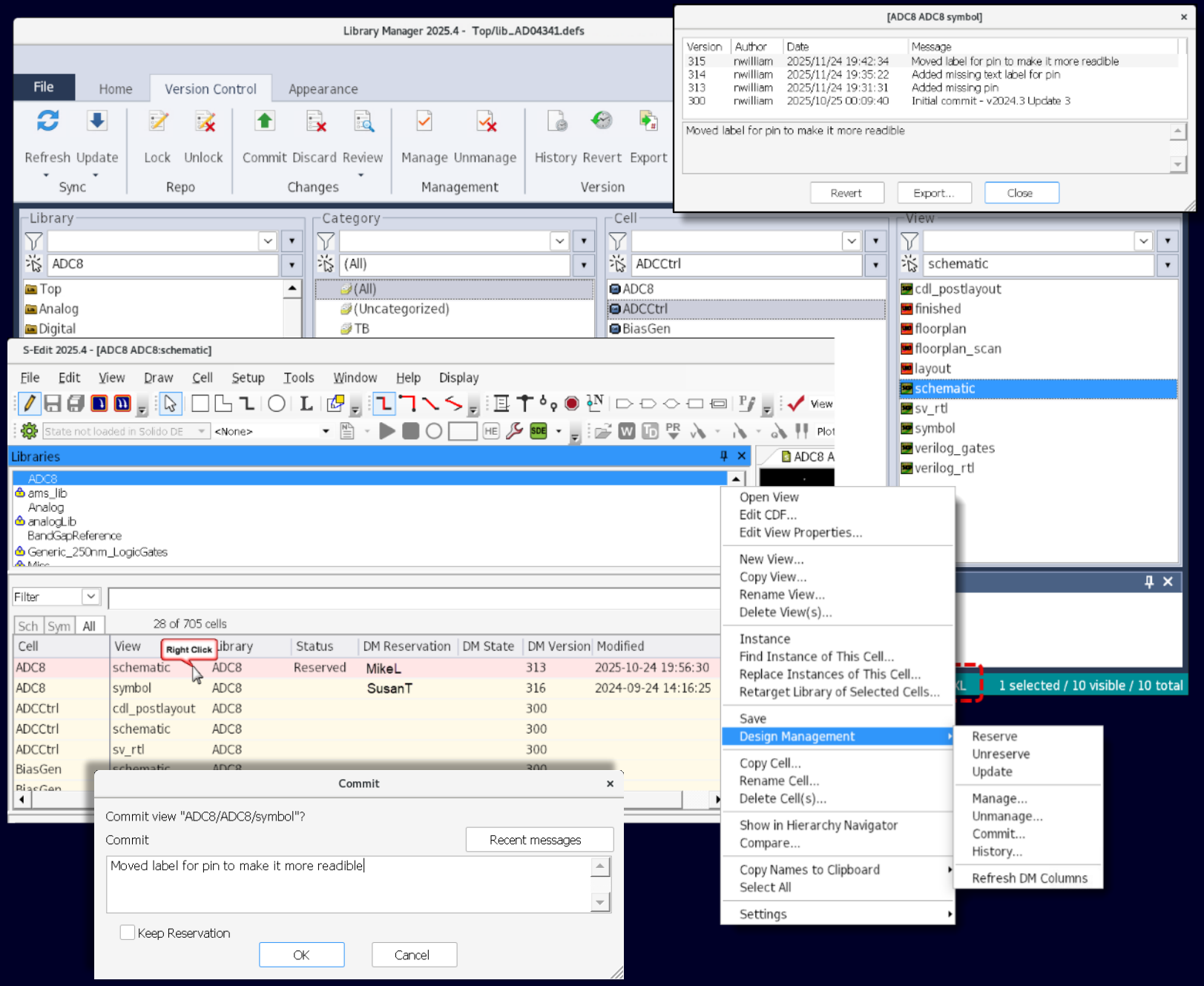
Third Party Integrations

- IC Manage revision control support
  - Most common revision control operations available directly in Library Manager, S-Edit, and L-Edit
    - Reserve (Lock)
    - Unreserve
    - Update
    - Commit
    - History
    - Revert
    - Export Previous Revision



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